

THE JOURNAL
OF
COMPARATIVE MEDICINE
AND
VETERINARY ARCHIVES

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RUSH SHIPPEN HUIDEKOPER, Veterinarian (Alfort),
W. HORACE HOSKINS, D.V.S.,
H. D. GILL, V.S.

CONTENTS.

ORIGINAL ARTICLES:	PAGE
Rabies in Sheep, with Inoculation Experiments on Rabbits. By A. W. CLEMENT, V.S., and WILLIAM ROYAL STOKES, M.D.	271
Atresia of the Right Posterior Naris in a Mare. By W. L. WILLIAMS, V.S.	274
Tetanus. By LEONARD PEARSON, V.M.D.	278
Open-joint. By A. H. BAKER, D.V.S.	283
Azoturia. By JOHN R. HART, V.M.D.	286
Pure Milk. By R. A. PEARSON, B.S.	292
The Examination of Horses for Soundness. By H. D. HANSON, D.V.S.	299
ABSTRACTS FROM FOREIGN JOURNALS:	
Diagnostic Worth of Mallein and Tuberculin—Establishment of a Veterinary Institution in Prague—Demand for the Reorganization of Veterinary Studies in Lower Austria—Society News—Urticaria of the Hog	303
REPORTS OF CASES:	
Lipoma Causing Death. By J. F. ROUB, D.V.S.	305
Hysteria—Dog. By H. W. SMITH, V.S.	306
EDITORIALS:	
Go Slow, Mr. Secretary—Not Always a Wise Procedure	307-311
NECROLOGY	311
CORRESPONDENCE	312
CONTROL WORK:	
Pennsylvania—Missouri—National—Nevada	316
BOOK REVIEWS	317
COMMENCEMENT EXERCISES:	
New York College of Veterinary Surgeons—McKillip Veterinary College—Veterinary Department, Columbian University—Indiana Veterinary College—Ontario Veterinary College—United States College of Veterinary Surgeons—Chicago Veterinary College—American Veterinary College	320-339
SELECTIONS:	
The Serum Diagnosis of Hog-cholera. By CHARLES F. DAWSON, M.D., D.V.S.	339
PERSONALS	341
SOCIETY PROCEEDINGS:	
Pennsylvania State Veterinary Medical Association—Veterinary Medical Association of New Jersey—Veterinary Association of the District of Columbia—Chicago Veterinary Society—Montreal Veterinary Medical Association—Veterinary Medical Society of Harvard College, Class of '99—Veterinary Medical Society of the University of Pennsylvania—U. S. V. M. A.	343-354

UNITED STATES VETERINARY MEDICAL ASSOCIATION.

Proceedings of the Thirty-third Annual Meeting held at
Buffalo, N. Y., September, 1896. (Continued.)

A Study of Cathartics (concluded). By M. H. REYNOLDS, M.D., V.M.	177
Physiological Variations. By W. L. WILLIAMS, V.S.	192

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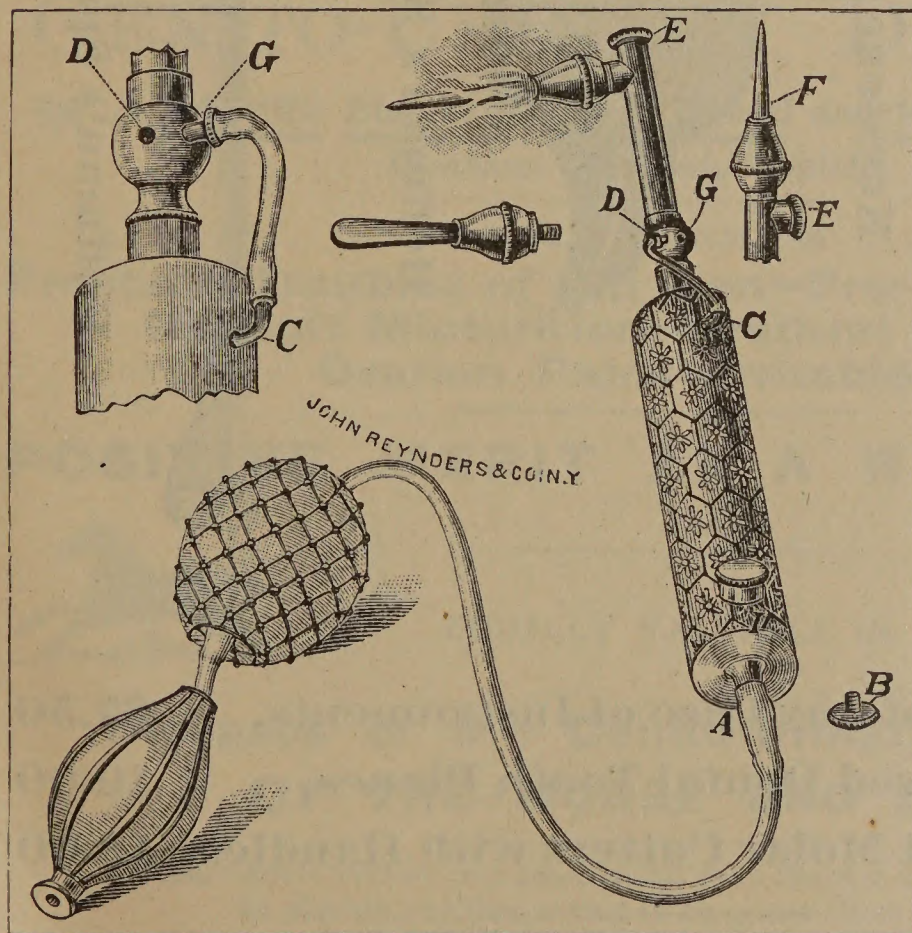
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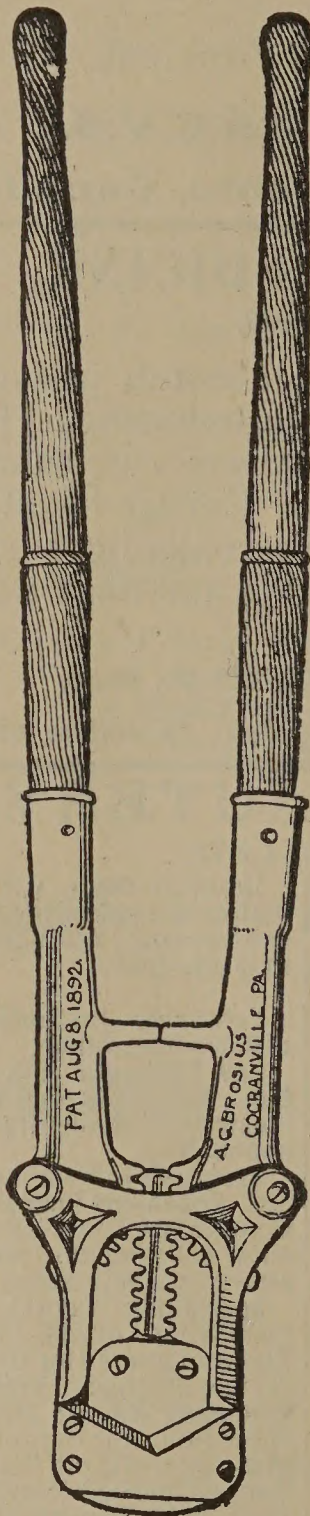
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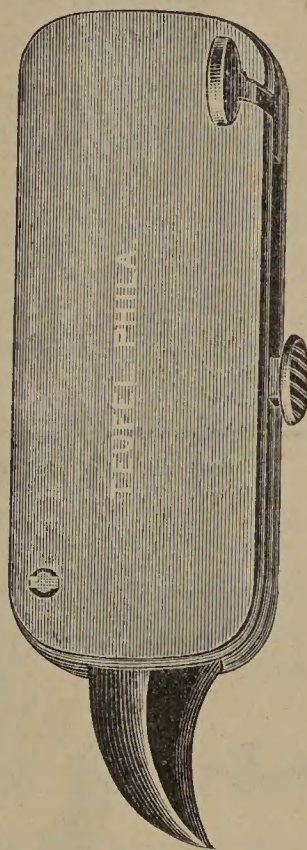
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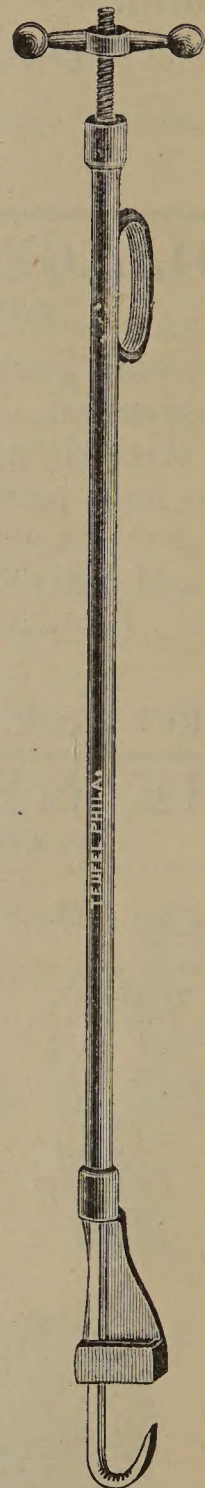
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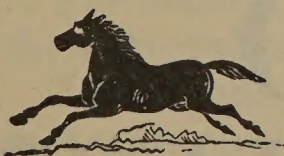
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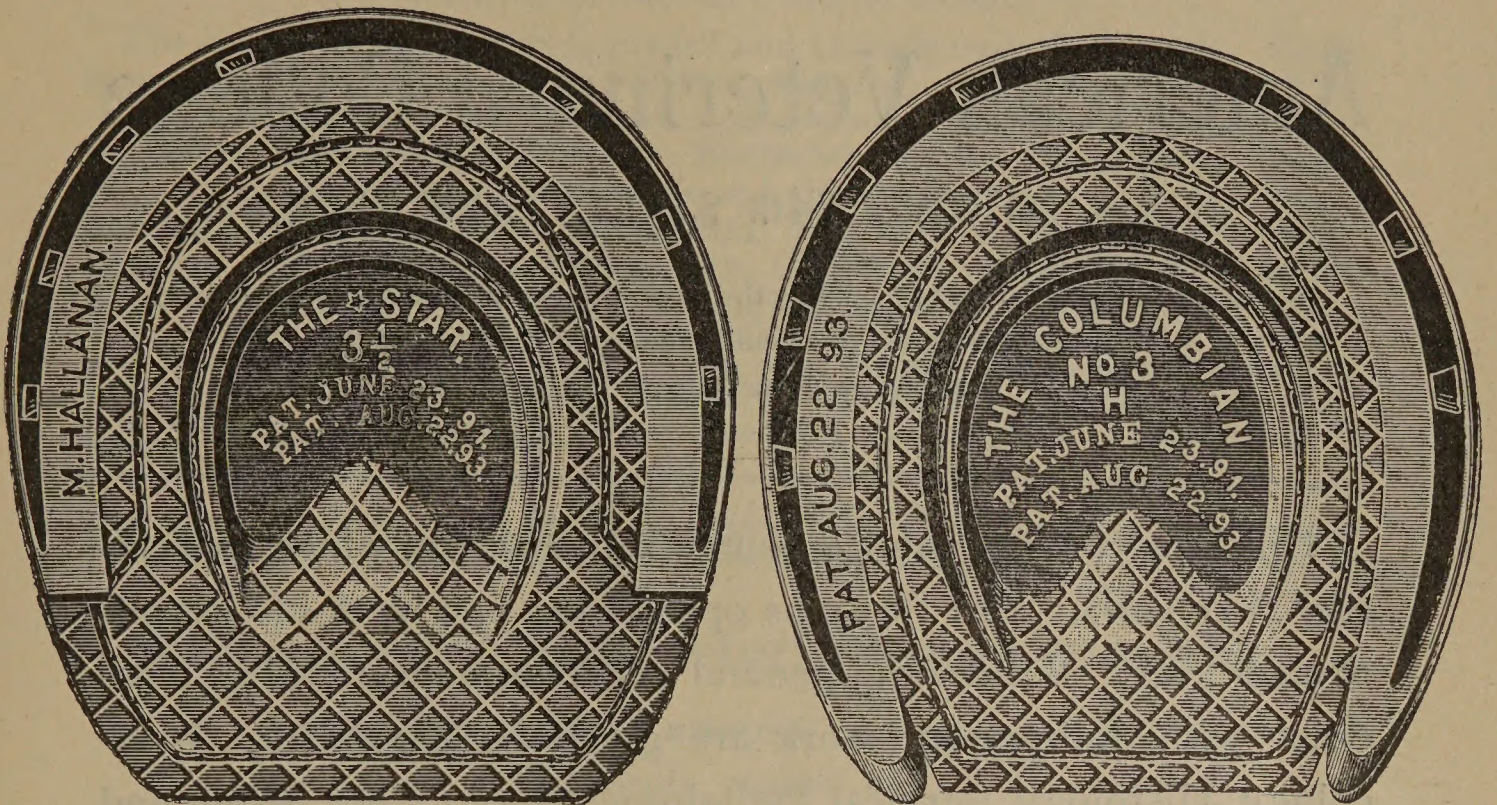
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VOL. XVIII.

MAY, 1897.

No. 5.

RABIES IN SHEEP, WITH INOCULATION EXPERIMENTS ON RABBITS.

BY A. W. CLEMENT, V.S.,
STATE VETERINARIAN, MARYLAND,

AND

WILLIAM ROYAL STOKES, M.D.,
BACTERIOLOGIST TO THE HEALTH DEPARTMENT AND LECTURER ON BACTERIOLOGY IN THE
BALTIMORE MEDICAL COLLEGE.

IN the month of July, 1896, a gentleman from Mullikens, Prince George County, reported "a strange disease" among his cattle and sheep, from which several had died and of which others were ill. I visited the farm the day after receiving notice of the outbreak, and heard from the owner the history of the outbreak and his observation of the symptoms.

He had twenty young cattle running in a field with abundance of shade, water, and grass, and in fine order. Two steers died first, within a day or two of each other, after a short illness. Ten days later a third steer was attacked similarly and died, and a month after the first steer was taken sick a fourth one died. When I arrived I found the fifth steer dead, but none of the remaining number appeared sick.

The symptoms as described by the owner were as follows: "At first they began to lose flesh rapidly. A few days afterward they isolated themselves and remained perfectly quiet. They would neither eat nor drink. After remaining in this condition two or three days they lost, to a certain extent, control of their hind legs and staggered as they walked. They then became very vicious and would attack any object, and bellowed constantly until they died."

The autopsy which I made upon the steer found dead showed no lesions whatever, though a thorough examination (excepting the brain and spinal cord) was made. I could make no diagnosis, and so informed the owner.

It was stated that a mad dog had passed through the neighborhood about Easter; but I, unfortunately, did not pay much attention to the statement, as it was some time before the hydrophobia excitement in Baltimore, and I had not seen a case of rabies since I was in Paris, ten years before. I did not believe that the dog had rabies.

About January 1st the same gentleman wrote me that he had lost several sheep on the same pasture where the cattle fed. Under date of January 4th he wrote that eleven had died, and he had discovered another lamb affected that afternoon. He described the symptoms as follows: "The face swells on both sides just below the nose, and one of the animals looked first to one side and then the other, as if in pain. They do not appear to suffer much, as a rule, and some of them eat a little. They all have the same vicious propensities from the commencement of the attack, which increase as the disease develops. As a general thing, they live about four days." As to the cause, the gentleman cited the observation of a neighbor, who said that he saw a dog chasing his own sheep about ten days before; since then he had lost three. He further wrote: "A dog has not been in this flock since last Easter, when three were killed, and some of the lambs which have since been affected were not born then."

In answer to this letter I asked the owner to ship me by express, well boxed, a live sheep affected with the disease, whatever it might be, for the purpose of making a thorough clinical observation and also that the condition might be most favorable for autopsy, cultures, and inoculations. Accordingly, on the morning of January 6th there arrived in Baltimore by express a full-grown ewe. This animal was secured in a crate. When not disturbed at all it would lie or stand perfectly quiet, except occasionally, when it would butt its head against the slats, as if attacking an imaginary object. No matter how quiet it might be, however, on the least irritation, such as kicking on the slats, making any extra noise, or even when one stood in front of the cage, it would butt the slats with all the force possible. There was nothing else observable about the animal as indicating disease. There was no frothing at the mouth, and the peculiar expression so characteristic of rabies in dogs was absent. At noontime the sheep was removed from the crate and placed in

a box-stall. The excitability appeared to increase, and the animal became gradually weaker. In the morning it was found lying on its side, unable to rise. There were clonic convulsions of the legs and severe opisthotonus. It needed only the touch of one's hand or of a stick on any part of the body to bring on the most aggravated convulsions. She died in one of these convulsions at 6 P.M., in the presence of Dr. Stokes and myself.

At 8 P.M. a careful autopsy was made, and cultures taken from the blood and organs. The result of the autopsy was negative. The brain was most carefully examined. Portions of the brain and medulla were reserved for rabbit inoculation. Appended will be found a description of the biological examination, made by Dr. Stokes.

In a letter of January 14th the owner says: "None have died since Friday, when four were buried. I have lost so far eighteen. The flock now looks more healthy. A gentleman who lives about four miles from here, I am informed, lost during the fall some sheep affected in the same way."

Biological Examination. The medulla was removed from the skull under antiseptic precautions, and a small portion of the tissue from the floor of the fourth ventricle was rubbed up with sterile water in a sterilized porcelain crucible. Two rabbits were then prepared in the following manner: The heads were shaved and a 5 per cent. solution of carbolic acid applied on cotton for about five minutes. A longitudinal incision was then made through the skin in the median line and the dura mater exposed by means of the trephine, the operation being performed under antiseptic precautions. About ten cubic centimetres of the suspension of the medulla were then injected beneath the dura of each rabbit and the wound closed.

Both animals were kept under daily observation, but nothing of interest was noted until the tenth day after the operation. Rabbit No. 1 then began to show characteristic symptoms. These symptoms began with slight incoördination of the muscles of locomotion when running. The symptoms of incoördination gradually increased, especially rapidly behind, followed by almost complete paralysis of the hind extremities, finally involving the front legs so that the animal was unable to move, in which condition he died on the eleventh day. The autopsy and the cultures of the blood and organs were negative. During the sixteenth day the second rabbit showed similar symptoms, together with clonic convulsions, and died on the seventeenth day. Autopsy and cultures were nega-

tive. (The first rabbit died during the night, so that the presence or absence of clonic convulsions was not noticed.)

The temperature of both animals during the period of incubation averaged 102° , but fell to 100° after the beginning of the attack.

Diagnosis. Rabies caused by transference of the virus of this disease from the medulla of the sheep.

Conclusions. The clinical symptoms of the sheep, the negative result of the autopsy, and the positive result of the inoculations point conclusively to the diagnosis of rabies. If this animal had rabies—a fact we believe beyond dispute—the other animals on the farm and on the two neighboring farms must have had the same disease.

Had inoculation experiments been made from the brain of the steers which died early in the summer the diagnosis would have been made then. This, however, would not have prevented the second outbreak of the disease, because undoubtedly the sheep died from subsequent inoculation from the bite of a rabid dog. Neither will the present knowledge of the case prevent further trouble unless something is done to check the spread of the disease in dogs. A well-bred dog is an animal most useful and companionable, but that is no reason why irresponsible people should own wild curs and allow them to run at large. A good dog-law, well enforced for a few months, would make rabies an unheard-of disease. It is a disease communicable only by inoculation, and, of course, cannot arise spontaneously.

We are much indebted to Dr. N. G. Kierle, medical examiner, and to Dr. John C. Moffit, for assistance in the technique.

ATRESIA OF THE RIGHT POSTERIOR NARIS IN A MARE.

BY W. L. WILLIAMS, V.S.,
PROFESSOR OF SURGERY, NEW YORK STATE VETERINARY COLLEGE.

THE subject, a small brown mare, aged four years, used for delivery by a retail butcher, had been recently purchased without a reliable history as to the date of the advent of respiratory difficulty, but it was said that she had suffered from an increasing dyspnoea for about one year.

As this is the date at which the animal would ordinarily be first put to work, in all probability the difficulty in breathing was merely not noticed until brought out prominently by labor.

Presented at the free clinic, October 9, 1896, it was observed that rapid driving caused severe dyspnœa and roaring, while at rest the respiratory sounds were normal, but the ingress and egress of air were confined wholly to the left nostril, the right being functionless.

Inspection revealed no facial deformity, no definite dulness nor want of resonance over any of the facial sinuses, no nasal discharge or odor, no cough, and no abnormality upon manual exploration of the mouth and pharynx.

The symptoms observed, in conjunction with the history of a gradually developing dyspnœa of a year's duration, led us to believe that we had to deal with a neoplasm encroaching upon the right nasal conduit.

On the following day the animal was cast and two exploratory openings made—one into the inferior maxillary sinus, near the fang of the fourth molar; the other against the median line of the face, on a level with the lower margin of orbits. No abnormality could be discovered from either, except that the turbinated bones, normal in structure, approached more nearly to the septum nasi than usual, until an attempt was made to pass a sound from the second opening through the posterior naris, which was found impossible.

After a prolonged effort and the use of as great force as seemed prudent the sound suddenly passed through into the pharynx, and upon its withdrawal a small quantity of air passed out through the right nostril, and blood passed from the nostrils into the pharynx, leading us to the erroneous conclusion that we had encountered a neoplasm and had passed the sound alongside between it and the bony walls of the posterior naris.

We were unable to learn the form, character, size, or attachments of the obstruction; concluded that a successful operation was impossible, and abandoned further attempts at surgical interference.

It was noticed that the patient now forced some air through the right nostril, and continued to do so; but its significance was not understood, and believing restoration of the animal to usefulness impossible, she was destroyed on November 26th and an autopsy made.

No neoplasm was found, but across the right posterior naris, continuous with the nasal mucosa on the outer and the pharyngeal mucosa on the inner side, was a thin, hymen-like membrane, stretching like a drum-head between the palatine, ethmoid, and vomer bones, completely occluding the opening except for a small rent in its centre, oval in form, three-fourths by one-half inch in diam-

eter, the result of the accidental opening made with the sound at the time of our exploratory operation. The occluded right posterior naris measured transversely from vomer to palatine bone seven-eighths of an inch, while the left measured one and one-half inches. The tissues were all healthy and showed no evidence of pre-existing disease of any kind, indicating clearly that the abnormality was congenital.

The cause of the deformity must be referred to early embryonic life after the endoderm of the ovum had, by infolding, produced the primitive intestine, ending anteriorly in the pharynx, in front of which the olfactory pits develop, but are for a time separated from the pharynx by a thin septum, which, becoming obliterated, brings about the opening known as the posterior naris.

In this individual the septum had become obliterated on the left side, while on the right the development had become arrested, the septum, as a result, persisting.

The bibliography relating to this form of arrested development is exceedingly limited.

Through the aid of my colleague, Dr. Law, I have been enabled to find the record of one similar case by Prof. Gamgee (*Our Domestic Animals in Health and Disease*, p. 622), who relates an instance observed by Hering in 1842, in which a filly, two and one-half years old, was presented to Prof. Hering for advice regarding a severe dyspnoea and roaring, which had been observed for a year. No evidence of tumor or other neoplasm or pathological condition could be found to explain the roaring, except that it was found that the right nostril was impervious to air and that a flexible sound could not be passed into the pharynx through the right nasal passage. Failing, like me, to make a diagnosis, the filly was destroyed, and, as in our own case, the autopsy revealed a thin septum stretched across and completely closing the right posterior naris, and, in full accord with our views in this case, he considered the cause an arrest in development in the early embryonic stage, by which the septum, at that time normal, failed to undergo that obliteration which should naturally follow.

Perhaps the deformity is more common than records would indicate, and it would seem not unlikely that in some cases both septa persist, leading, especially in foals, to early death, owing to the difficulty it has in breathing through the mouth; hence it would seem well for veterinarians to have in mind the possibility of the occurrence of this peculiar form of arrested development, its diagnosis and treatment.

The diagnosis offers no great difficulty to the veterinarian cognizant of the occurrence of such an abnormality. We observe:

- a. Dyspnœa and roaring.
- b. Imperviousness of the affected passage to air.
- c. The absence of any neoplasm or tumors in the nasal passages or sinuses, or of dental or other diseases leading to suppuration or other changes capable of interfering with respiration.
- d. The nasal passage and nostril free; though, perhaps owing to non-use, the turbinate bones are nearer to the nasal septum than ordinarily observed.
- e. The posterior naris closed, as shown by the impossibility of passing a sound into the pharynx, but permitting the sound to pass over the naris until the ethmoid bone is reached.
- f. The Polansky-Schindelka rhino-laryngoscope would enable one to observe the actual condition of the deformed part.

The Gunther Eustachian catheter should prove an excellent sounding instrument, or in its absence an effective sound of similar form could be improvised—that is, a rod about one-fourth of an inch in diameter, with a slight curve anteriorly, commencing about two inches from the anterior end. With this sound measure the distance from the superior angle of the nostril to the lachrymal angle of the orbit, which will about equal the distance from the inner border of the nostril to the centre of the posterior naris.

Passing the sound along the floor of the nasal chamber, it will be found that when it reaches the point indicated by the measurement, instead of passing *downward* into the pharynx, it glides *upward* for a distance of two or three inches and stops against the ethmoid bone. A common flexible horse-catheter would answer the purpose well, but perhaps not so well as the metallic sound.

The treatment is exceedingly simple, and consists merely in pushing the curved end of the metallic sound through the membranous partition, and then enlarging the opening, or an opening may be made alongside of the septum nasi, just below the frontal sinuses, and an ordinary pair of curved forceps of sufficient length passed downward between the septum or vomer, striking the persistent membrane almost at right angles and rendering its rupture and laceration to any degree desired readily accomplished. The removal of the lacerated portions would be quite unnecessary.

A satin-lined burial-casket covered the remains of a Long Branch dog, whose master thus attested to the fine qualities the animal exhibited.

TETANUS.¹

BY LEONARD PEARSON, V.M.D.,
PHILADELPHIA, PA.

TETANUS of horses is a disease that has been known since the earliest times, and was described by Apsyrtus during the fourth century. The views in regard to this disease that have prevailed at various times have differed widely, and it has variously been ascribed to an "inflammation of the blood," an injury to the brain or spinal cord, a peculiar electrical condition of the atmosphere, foods of various kinds, etc. Subsequently tetanus was divided by the writers of text-books into several varieties, particularly traumatic, rheumatic, idiopathic; and each of these forms of disease was ascribed to different causes. It was not, however, until the researches of Nicolaier that the real cause of tetanus was discovered. Nicolaier's first announcements were published in 1884, and they were amply supported and confirmed by the researches of Kitasato, published in 1889. Kitasato was successful in isolating and in growing, in pure cultures, the tetanus bacillus, and he proved by the inoculation of animals that the disease could actually be produced by the bacillus that he had isolated and described.

The tetanus bacillus is an organism of rather peculiar shape. It is rather long and slender, and has a round enlargement at one end, which contains a spore. This bacillus has been found in earth, in pus, in manure, and in the secretion from infected wounds. The bacillus is isolated in the laboratory with much difficulty, because it will only grow where there is an absence of oxygen.

The spore of the tetanus bacillus is quite resistant, very much more so than the bacillus itself, and it requires heating at boiling temperature from two to five minutes to destroy it. The isolation of the germ in the laboratory is based upon this characteristic, and is carried out after the method first described and employed by Kitasato. A small quantity of the material to be examined is exposed for an hour at a temperature of 80° C., and in this way all of the bacteria and most of the spores in the substance, with the exception of the spores of tetanus, are destroyed, and the inoculation of culture media with material so treated enables one to obtain a pure culture of the tetanus bacillus without much further difficulty. The tetanus bacillus, and particularly its

¹ Read before the meeting of the Pennsylvania State Veterinary Medical Association, Philadelphia, March 2, 1897.

spores, is not only resistant to heat, but to other conditions that are unfavorable to the growth of germs. For instance, it requires exposure to a 5 per cent. creolin solution for five minutes or to 5 per cent. carbolic acid solution for ten hours to destroy it. A 5 per cent. carbolic acid solution, together with 0.5 per cent. of hydrochloric acid, destroys these organisms in twenty-five minutes. A particularly strong antiseptic for the spores of the tetanus bacillus is trichloride of iodine. This fact was discovered by Behring, and has been made use of in a number of important experiments. These germs are not only resistant to the digestive fluids, but they may even multiply in the digestive tract. This accounts for their presence in the manure of horses.

The tetanus bacilli are so widely distributed, and find the conditions outside of the living body so favorable to their existence, that opportunity for infection is abundant, and there are few places that are entirely free from this disease, although it is far more prevalent in some localities than in others. The manner in which the bacillus is introduced into the living animal is a matter of considerable moment as regards the danger of such inoculation, since the organism will not grow in the presence of oxygen; all inoculations with the tetanus bacillus are not dangerous, but when the organism is introduced deeply into the tissues away from the air, or when it is introduced with other germs that use up the oxygen in the surrounding parts, tetanus may develop.

The wounds that are especially apt to be followed by the development of tetanus are wounds made by objects that have been in contact with the earth, and are therefore most apt to contain tetanus germs. For instance, pricking of the foot is especially dangerous in this respect, and a calk-wound of the coronet is also accompanied by considerable danger, as it is likely to be made by an object that has been in contact with earth and manure, and to be coated with more or less tetanus bacilli. A deep puncture with a piece of wood, castration, and docking have also been followed in many cases by tetanus. The use of clamps in castration was frequently followed by tetanus in the olden times, when it was not customary to disinfect these instruments. The infectious wound-secretion containing the bacilli and spores of tetanus would in this way be carried from one colt to another, and the death of a large proportion of the animals castrated by certain operators or in certain districts was not uncommon. The not rare cases of tetanus that occur without an external injury are explained by the assumption that infection has taken place through a wound that was so small

as to escape notice, or that infection occurred through the mucous membrane of the intestinal canal.

The disease, tetanus, is caused by the tetanus bacillus by means of a toxin, or ptomain, that is developed by this germ. This substance is produced by the germs at the point of inoculation. It is carried by the circulation to all parts of the body, and its action on the central nervous system is such as to produce the muscular spasms that are characteristic of the disease. The toxin of tetanus is also produced when the germ is grown in culture-media in the laboratory, and it has been found that the injection of a small quantity of toxin that is entirely free from living organisms will produce the symptoms of tetanus. The power of this toxin is extraordinary, and but a very small quantity of it will produce death.

The rapidity also with which the toxin is developed is astonishing. Kitasato has found, for instance, that when mice are inoculated at the root of the tail, and afterward the skin and subcutaneous tissues around the inoculation are removed and cauterized, the treatment is without avail unless it is performed within one hour after the inoculation. In cases of tetanus toxin is found in the muscle-juice, the blood, the urine, and in the milk. As the toxin gradually passes from the point of inoculation, where it is developed, into the general circulation, it is noticed that rigidity of the muscles begins in the inoculated member or part of the body and gradually extends to the more distant portions. It has been shown by Nocard that by the time the symptoms of tetanus appear in the horse the saturation of the tissues with tetanus toxins is quite general, and the amount of toxin contained in the body at that time is enormous.

The bacilli themselves never enter the blood, and, of course, cannot pass into the circulation, and after they have elaborated enough toxin to cause death the post-mortem appearances, as is well known, are about normal, with the exception of the suppurating wound at the point of inoculation and more or less congestion of the central nervous system.

It has been shown by experiments conducted by Behring and Kitasato that the trichloride of iodine restricts to a very great extent the vitality and virulence of the tetanus bacillus, and by introducing into susceptible animals small quantities of tetanus cultures that have been treated with this agent, and gradually increasing the strength of such cultures by using smaller quantities of the trichloride of iodine, a certain degree of immunity can in time

be developed, so that at last very large quantities of pure culture can be introduced without producing tetanus. An animal treated in this way gradually develops in its blood a chemical substance that neutralizes the effect of the toxin of tetanus, and which is, therefore, known as an antitoxin.

The immunity that the animal possesses depends upon the antitoxin that is present in its blood. If another susceptible animal is inoculated with a fatal dose of tetanus toxin, and is treated immediately thereafter with an adequate amount of antitoxin derived from the serum of the immunized animal, the development of the disease will in this way be prevented, and it is upon this principle that the treatment of tetanus with antitoxin is based. Experiments conducted by Vaillard and Rouget have shown, that if the toxin is removed from the tetanus bacilli, they can then be introduced into an experimental animal without evil effects, because they are quickly taken up by phagocytes and destroyed; but when tetanus bacilli containing antitoxin are introduced they are not taken up by phagocytes, and quickly produce toxin, causing the development of tetanus. The antitoxin, injected immediately after the toxin-containing bacilli are introduced into the body, neutralizes their poison to such an extent that they can be destroyed by the phagocytes; but if the antitoxin is not present in the blood when the animal is inoculated with the germs of tetanus, or if it is not introduced into the circulation shortly thereafter, the tetanus bacilli produce so much toxin that it cannot be neutralized, and the development of tetanus cannot be prevented. That is to say, tetanus can be prevented with great certainty by the use of antitoxin; but when the symptoms of the disease have once appeared there is so much toxin in circulation that it cannot be neutralized by any amount of antitoxin that it is possible to introduce, so that the treatment of tetanus with antitoxin is not yet established on a profitable basis.

The prevention of the disease, however, by the use of antitoxin is in many instances practicable and a valuable resource. For example, it is known that tetanus is much more prevalent in some districts than in others, and that exposure is frequently followed by tetanus. It is also known that on some farms and in some stables tetanus is a common disease, and even slight injuries result in death from this cause. Under these conditions it may be serviceable to administer to the animal an immunizing dose of antitoxic serum, after which the contemplated operation may be performed without risk. Or if a valuable animal sustains a puncture of the

foot or a punctured wound or a calk-injury, and particularly if the animal is kept in a stable where tetanus has previously appeared, it would be advisable as a general precautionary measure to protect it by the use of antitoxic serum.

My attention was recently called by Dr. Walters, of Wilkesbarre, to a mine in Dauphin County wherein there were almost one hundred mules, and of these twenty-three died of tetanus during a period of about two years. In January five or six died. I obtained some tetanus antitoxin, which was administered to fifty mules that occupied the stables in which the tetanus had previously appeared. Since that time no cases of tetanus have been reported.

Tetanus antitoxin has been used most extensively by Nocard in France, and Schutz in Germany, and they report that the mortality from tetanus has been considerably reduced by the use of this agent in districts where the disease prevails extensively and where antitoxin has been used before operations and after injuries as a precautionary measure.

The recent researches that have been made in relation to this disease, and the knowledge that we now have in reference to its toxin, explain the indifferent results that have attended the use of medicines. While it is true that certain therapeutic agents will, for a time, prevent the spasms that occur in tetanus, they cannot cure the disease, for they do not neutralize the poison, and as soon as the animal emerges from the effect of the drug the spasms are as bad as ever; but during the entire period the nervous system is irritated by the toxin it is gradually losing its vitality, and the animal is approaching death.

The only forms of treatment that are at all promising in the light of our present knowledge of this disease are: (1) The use of tetanus antitoxin; (2) the excision or sterilization of the local wound; (3) complete quietude and rest, thus giving an animal an opportunity to conserve its strength to the greatest possible degree, and make its conditions most favorable for overcoming the action of the toxin. It may be that other means of neutralizing the toxin will in time be discovered, or that it may become possible to produce the elimination of the toxin from the body; but as yet all efforts in this direction, including the use of purgatives, diuretics, and diaphoretics, have signally failed. Our greatest hope is in the development of the antitoxic treatment.

Chicago has a mounted brass band of thirty-five pieces.

OPEN-JOINT.¹

BY A. H. BAKER, D.V.S.,
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OPEN-JOINT is one of the most serious and one of the most common traumatic ills we meet with in everyday practice, and one that is skimmed over lightly or not noticed at all by authors on veterinary surgery, and, I feel free to say, one in which is employed the most old-fashioned and generally useless treatment of any. We notice veterinarians using the same remedy and general procedure to-day that our forefathers used, in many cases not even giving the same usually good treatment that ordinary simple traumatisms receive. Poultices and blisters seem to be the popular remedies of many of our best men and teachers in veterinary schools.

With a view of recalling to mind the serious nature of the trouble, I will briefly run over the pathogenesis of it. An open-joint is a wound where the skin, the binding and capsular ligaments, and the synovial membrane are ruptured, allowing escape of the synovia and ingress for germs of various kinds that cause inflammation of the tissues, especially synovitis and oftentimes arthritis. The case runs through four well-defined stages: First, a flow of pure synovia in limited quantity. Second, as the inflammation develops the flow of synovia increases, and, if confined so as to accumulate, it coagulates in the form of an amber-colored, odorless clot; the joint swells, becomes painful; fever develops, the pulse is hard and increased in frequency, the animal is restless and inclined to keep the affected limb in nearly constant motion if the trouble is below the elbow or stifle; he usually persistently stands, becomes tucked up, and emaciation is rapid; after a couple of days more or less pus is mixed with the discharge. Third, the articular cartilage becomes involved, suppurates, ulcerates, and becomes absorbed; the discharge in this stage is offensive and occasionally streaked with blood; the limb swells extensively, and numerous abscesses form around the affected joint, rupture and form sinuses; the swelling becomes indurated; he never bears weight upon the limb, usually ruins the other leg, and dies in the course of two to six weeks. If it runs a somewhat milder course, with less swelling, suppuration, and induration, it runs into the fourth stage, in

¹ Read before the March meeting of the Chicago Veterinary Society.

which the articular ends of the bones become involved in a rarefying ostitis, with a liberal exudation of lymph, which coagulates, organizes, and ankylosis is the result, more or less ruining his usefulness, according to which joint is affected and the class of work he is adapted to. The leg is always permanently enlarged, with considerable ossification of the inflammatory deposits.

In suggesting a rational plan for treatment I bear in mind that the immediate cause of all this trouble can be summed up in one word—*sepsis*, and that the secret of success in treating an open-joint lies also in one word—*antisepsis*.

Septic germs find a fertile field in such a wound, and the synovial membrane, being apparently very sensitive, yields quickly to the irritation produced by them. The germs may enter at the time of the accident, or afterward, and it is these that we have to fight from the start. Poultices are an abomination, no matter how well they may be cooked with a view to sterilize them, or how well the attempt may be made to sterilize them by the use of antiseptics, for germs will work their way in between the poultice and the skin, and often find a fertile soil in the poultice itself. Blisters are nearly as bad. They serve to increase the pain by producing extension of the inflammation to the more superficial parts without reducing it in the joint. They tend to close the external opening by the swelling they produce; this, however, does not lessen the activity of the destructive process going on inside, but rather tends, in my opinion, to promote it and to increase the liability to form abscesses and sinuses in the surrounding tissues. Treatment, to be rational, must be directed toward reducing the inflammation by removing the cause, viz., destroying the germs that have entered the wound, and allowing granulation to go on in a natural way.

The first thing to do is to remove the hair as closely as possible from a considerable surface, remove shreds of lacerated tissue, if any, wash the wound with soap and water, then irrigate it thoroughly by syringing with an antiseptic lotion. Do not introduce the nozzle of the syringe into the wound, but, holding it a little distant from it, shoot the lotion into it with a little force for ten or fifteen minutes; then do it up by covering it freely with an antiseptic powder—for instance, iodoform, powdered boric acid, and starch in equal parts—and apply a good-sized pad of absorbent cotton over it, and hold it in place with a bandage. Dress it night and morning. This is imperative on account of the necessity of removing the synovial clot that forms on the cotton. If the case does not do well with this treatment, it is because the wound is not

aseptic, and in such a case there is the continuous motion spoken of induced by the pain. In such a case more heroic surgery is needed. The wound, probably, is too small; enlarge it with a probe-pointed bistoury half an inch each way upward and downward, making a V-shaped opening; irrigate it again, no matter if the lotion enters the joint. Use for this purpose bichloride of mercury, 1 to 2000, for ten minutes, then reduce it to 1 to 5000 to rinse out the stronger solution; then do it up as before, and put on an iron brace to stiffen the leg, to prevent motion in the affected joint. The necessity of this should be anticipated, and the proper shoe applied to the foot before too much soreness has developed. Immobility in an open-joint is a *sine qua non* to success. The brace is the only effectual means of accomplishing this. The old-fashioned splint is a failure. The brace does not interfere with the application of the dressings, nor does it chafe the leg, if properly padded.

The brace is made of half-inch square iron, with a hook on the bottom to hook into a hole in the bar of a foreshoe, being bent to fit the outline of the back of the leg, running up to the middle of the arm, with a piece of broad band-iron fastened to it at the top to clasp the arm. One or two leather straps are fastened to the brace between the band and the foot, to keep the leg in its natural position. The brace for a hindleg is hooked into the toe of the shoe, and is bent to follow the outline of the front of the leg up to about four inches above the hock, with similar band and straps as for the forelimb. All of the bearings between the brace and the leg should be well padded.

In cases of open-shoulder, hip-joint, or stifle-joint the swelling is apt to be excessive. The wounds usually require enlarging with a knife to afford ample opportunity for thorough irrigation. The wound is usually deep on account of the swelling. This condition enables us to insert an antiseptic plug—not to prevent the flow of the discharge, but to keep out germs—composed of solid extract of belladonna, tannic acid, and carbolic acid, one drachm each; wheat-flour, two ounces; water, q.s. to form a paste. Press a little of this well down into the wound, then foment the swelling with warm water persistently, and repeat three times a day.

Open navicular joint is a very common case in city practice, and one that very often results disastrously, either in death of the animal or permanent lameness. When a nail-prick is found to be an open-joint, the soaking and poultices that had been used up to that time should be discontinued, the hoof and frog freely pared

away, and the wound freely exposed and enlarged to permit of irrigation. After doing this do it up in a 3 per cent. solution of carbolic acid, with oakum for a pack. Let it cover the sole, heels, and coronet. Keep this wet continually by pouring the lotion freely into the pack several times daily. Renew the pack night and morning to remove the oakum soiled with the synovia and pus. Instead of hot fomentations, whether there is swelling or not, ice-packs or ice-water may be applied and kept up persistently until healing has advanced to a point where there is no more danger of severe inflammation.

Open-joints treated in this way almost invariably make good recoveries, the inflammation subsides, the flow of synovia gradually stops, the wound granulates and heals by second intention without suppuration.

If some swelling and considerable lameness persist, especially in the foot, repeated cantharidean blistering and long rest will usually lead to resolution.

If the horse will lie down, I prefer to have him do so ; but if he persistently stands, put him into slings during the more acute stage.

Open-joints that occur as a result of necrosis and sloughing beneath the skin in cases of contusions usually prove fatal on account of the extensive disorganization.

AZOTURIA.

BY JOHN R. HART, V.M.D.,
PHILADELPHIA.

[A SYNOPSIS of a paper read in 1883 by John R. Hart, V.M.D., of Philadelphia, with such modifications as circumstances and lapse of time would seem to warrant.

That paper contained the expression of an opinion, much criticised at that time, that azoturia was purely a liver and kidney disease, and the careful investigations of the subsequent fourteen years have but confirmed the opinion that azoturia is primarily due to a diseased liver.]

Liver. Physiology teaches us that the function of the liver is to secrete and to excrete. Any disease that retards these processes, or any derangement of this organ, lessens secretion of bile, which is one of the most important factors in the animal economy. The

¹ Read before the meeting of the Pennsylvania State Veterinary Medical Association, Philadelphia, March 2, 1897.

other function is to change the blood during its transit through the hepatic circulation, whereby it is fitted for its subsequent purposes in the animal. From autopsies I have made I am led to believe that more derangement to the system results from an inactive liver than we are aware of. Torpidity of this organ has a tendency at all times to cause indigestion. One of the chief functions of the liver is the secretion of bile for the purification of the blood by the ultimate excretion of effete matter, as you all know that bile is not discharged through an excretory duct or from a reservoir in the horse, but passes directly into the intestinal canal, where it mingles with the chyme directly after it leaves the stomach. This shows the relation it has with the food with which it is mixed. We know it is alkaline in its reaction. Any alteration in its natural constituents has a deleterious effect on the general system.

Physiology teaches us that the liver arrests and renders harmless toxic substances which originate in the intestinal canal. If you have an inactive or diseased liver, this function is not performed and the toxins pass into the blood. The comparative toxicity of the portal and hepatic blood demonstrates that poisoning has no time to develop. The animal appears to succumb to an intestinal hyperæmia and consequent cerebral congestion in some cases. Professor Leonard Pearson, of the University of Pennsylvania, some six years ago called my attention to a gray gelding at that institution on which he had held an autopsy, which disclosed in the liver fatty degeneration, kidneys very much congested and large, lungs congested, and the entire alimentary canal in an intensely congested condition. The owner of this animal said that it had left the stable in apparently sound health three hours before its death.

I think we may therefore conclude that the liver is an organ of protection to the animal; that it arrests more or less toxic material in general, but not the whole, as a part passes out with the urine.

The liver is not the only organ which acts the part of a protector to the organism against poisons; we may consider as an auxiliary agent of protection rapidity of intestinal expulsion by the stools. Alterations in the intestinal contents result in the formation of hard fecal masses, which are harmless because absorption is no longer possible. We have a hurtful constipation, and from this the nervous system suffers—an example of reflex action.

Continued unusual pressure produces excessive activity of the nerves supplying the part; excitability is finally abolished, and

paralysis of the nerve power occurs locally, as is seen in over-distention of the bladder. A constantly overloaded condition of the bowels may produce either of these local results on the nerve-filaments themselves. This effect travels backward to the motor ganglia in the lumbar cord, and defecation, being essentially a reflex act, when its directing centre is not sensitive to the controlling impulse of the brain, does not occur promptly and the constipation thus reacts upon the whole system. This produces a form of azoturia that is invariably fatal.

As for the biliary salts, they do not kill by direct intoxication alone; they dissolve and break up blood-globules and other cells, striated muscular fibres, and cells of the liver. They therefore cause anatomical lesions, and intoxication arises from the setting free of toxic substances which enter into the composition of the cellular elements. This intoxication develops but slowly. So long as there is functional activity of the kidneys, all is well; but if this activity ceases, then death may result from the other products of cellular destruction. It is said that if all the bile which the liver secretes passed directly into the blood, man would be poisoned by his own bile in eight hours. If all the urine that the kidneys secrete passed directly into the blood, man would be poisoned by his own urine in two days. We see the danger which results either from an impediment in the way of the elimination of bile or from its absorption. Fortunately more than one-half is eliminated in twenty-four hours by the digestive canal. What becomes then of the half of the bile which is not thrown out by the digestive canal? Does the liver destroy it? Does the tissue change it? These two hypotheses are possible, but are not demonstrated. What is demonstrated is that in the intestine a portion of the bile ceases to be absorbable. The coloring-matter and the biliary salts are metamorphosed, precipitated, or rendered insoluble; yet in certain morbid conditions bile may be absorbed in the liver itself at the margin of the hepatic cells. In these cases if the kidneys remain permeable they ward off intoxication; if they have ceased to be so, poisoning is the result.

The above facts lead to the conclusion that when from a faulty liver we can have, aside from liver and kidney, a third source of poison for the blood, as we do in azoturia (that is, putrefaction), not only that which arises from the imperfectly digested matter, but that which the presence of microorganisms in the intestinal tube incessantly maintains in the digestive canal, the conditions most favorable for the elaboration of poisons are realized. Therein

are found nitrogenous substances already peptonized, and peptones are, as you know, excellent culture-media for microbes.

The conditions favorable for the maintenance of putrefaction are so numerous that we ask whether digestion can ever go on normally. Fortunately the stomach secretes, on the introduction of food, a juice—hydrochloric acid—which arrests fermentation.

Bile is regarded as capable of prolonging the arrest of fermentation, but it is capable of undergoing fermentation itself, or of putrefying. It can therefore only feebly oppose fermentation in the small intestine. At any rate, it can have no influence upon that which is actively carried on in the large intestine.

Thus we find the small intestine, on the one hand, and the large intestine particularly on the other, capable of passing products of putrefaction into the blood. But are the putrid substances toxic?

Gaspard in 1822 established the fact that putrid substances are toxic and that they are actually more so than substances arising from disassimilation. He injected into the veins of animals liquid from putrid blood of meat. He induced faintness, diarrhœa, hyperæmia of mucous membrane, then death. At the autopsy ecchymoses of the digestive canal were seen; also of cellular tissues and of muscles of heart, swelling of spleen and mesenteric glands, and congestion of lungs. All these conditions are found after death in azoturia.

We may have alterations in the liver, due to a congested condition, which, if continued or frequently repeated, would result in bilious contamination of the blood. Or perhaps from some previous disease we may have alterations in the liver that would have a tendency to prevent it from doing its proper work. Any inability of the liver or derangement of its functions would cause changes to take place in the alimentary canal, bile being in part reabsorbed into the blood, contamination following.

Now, what effect have the alterations mentioned, and what are the toxins? The organism contains poisons the origin of which we know—the destruction of cells, disassimilation of secretions, ingestion and putrefaction. The digestive canal contains poisons which come from ingesta, bile, and putrid material; its contents therefore should be toxic. Experimentation has demonstrated that they are toxic from the potash and ammonia, toxic from bile and putrid material. While you cannot demonstrate experimentally that the poison enters the blood, you can demonstrate that it leaves the blood. When bile ceases to flow into the intestines it passes into the blood. This problem cannot be solved. Any alteration in the

liver caused by disease will prevent the excretion of effete material. Now if such is the case, where will this effete material go? Will nature allow it to so flow or be taken up by some channel whereby the blood will not become contaminated with it? It has been shown that it does not. The result is that the effete material collects in the blood. With what results? To act as powerful irritants in the animal circulation. This material first prevents the proper flow of the blood; second, causes a complete stasis; third, a dilatation of bloodvessels; fourth, a direct pressure upon the nerves; fifth, a complete loss of power from pressure on the nerves; sixth, decomposition.

In my paper on azoturia in 1883 I stated that azoturia was purely a liver and kidney disease. At the present date I feel more than convinced that azoturia is purely a liver and kidney disease. The question may be asked, Why should the kidney be a factor in this disease of the liver? In conjunction with the paralysis by dilatation of the renal arteries, caused by the effete material circulating in the blood.

Guitéras says any agent that causes an obstruction of the circulation, or nervous influence which may act by trophic derangement by causing circulatory disturbance, vasomotor action, the necrosed part may be absorbed, retained, or discharged. We have general excess of blood where there is a condition of plethora, a true hyperæmia; with this we have nervous influence. This may be due to paralysis of vaso-constrictors, whereby the outflow of blood is prevented.

Now, from a pathological standpoint there is really no disease of the blood, but rather of organs, and we study conditions of the blood and blood-making structures, mainly the bone-marrow, the lymph glands and spleen, the blood-destroying organs, of which the liver and spleen are important ones.

Lymph glands. Their functions are to form blood-corpuscles, to filter lymph—for this flows between the cells of the lymph-adenoid tissues. In this way injurious substances are prevented from entering the circulation at times.

Dr. Wood says hæmoglobin causes a dark cherry-brown color in blood. The enormous blood-pressure forces the capillary circulation through the tissues.

Kidney. Now, what part does the kidney take in this disease, as a preventive organ, and what part of the nerve-functions are involved, one with the other, to cause the disease of azoturia?

Pathologists usually divide the course of a disease into three

stages or periods: First, that of increase; second, that of acme, in which the symptoms remain stationary; third, that of decline. But these stages are far from existing in all diseases or following one another in regular succession. In acute disease alone are they presented with distinctness and regularity. In azoturia which breaks out suddenly in its full force the first stage is wanting, and the record terminates abruptly in death without any period of decline.

It will be quite proper to attribute to it only one part of the phenomena which might supervene when the impermeability of the kidney is such that it can no longer eliminate the toxic substances produced by the organism in proportion to their formation. With a kidney acting well, things may not go further; but if the renal emunction is insufficient, we may see developed traces of uræmic intoxication through simple exaggeration of intestinal fermentation. While the kidney itself may not be really diseased, it will be sufficient, for the quantity of toxic material introduced into the blood should exceed the activity of the kidney and its ability to eliminate it.

The quantity of toxic matter eliminated by the kidney in twenty-four hours is, without doubt, in excess of what is necessary to kill the whole body.

Now, if the kidney is unable to do its work properly from some previous ill condition, or has been doing some extra work for the liver, the blood will quickly become contaminated, and the result will be azoturia, as if all the bile secreted in eight hours was introduced suddenly into the blood, we should see fatal nervous effects produced immediately; but as elimination is constantly being effected through the kidneys, and as the fibres of connective tissues are being incessantly colored, while the blood reabsorbs only gradually, nervous accidents are thus averted. The tissues serve to protect the organism against these poisons. Experiments have shown that this coloring-matter is ten times more poisonous than biliary matter. Salts become fixed.

When we consider the functions of the kidneys we are more able to understand the important work they are called upon to perform in azoturia. They eliminate all superfluous matter that may arise. Blood filled with effete material will stop the secretion.

It requires the kidney to be considerably diseased, for, owing to its permeability, it is sufficient alone to eliminate the poison formed by the organism in proportion to its production. Below this rate commences intoxication. But before this arises we see abnormal

phenomena appear. First, albuminuria. Albuminuria is the accident of bad repute in diseases of the kidney.

The extreme cases belong chiefly to amyloid nephritis, because in such the liver, spleen, stomach, and intestines are diseased. All the organs whose function it is to transform the peptones of digestion into serum-albumin have undergone deterioration at the same time as the kidneys.

When such a large number of organs are diseased we can scarcely regard all the accidents which happen as due to renal impermeability. We cannot say that there is uræmia nor even kidney disease. There is a general disease of organs concerned in assimilation.

The inability of the kidney to do this extra amount of work is indirectly the cause of the paralysis, while the diseased liver, on the other hand, is the direct cause of the diseased kidney. The question may be asked, How is the liver the direct cause? From a pathological point, any derangement of the liver increases the labor of the kidneys.

The kidney becomes inactive from this source, and then refuses to perform its work. Functions are lost for the time being, with the result that the blood becomes contaminated with urea, as every aliment would become a poison if renal elimination was not the safeguard of the body.

(To be continued.)

PURE MILK.

BY R. A. PEARSON, B.S.,

ASSISTANT CHIEF, DAIRY DIVISION, UNITED STATES DEPARTMENT OF AGRICULTURE.

(Concluded from page 193.)

THE chief sources of infection are dirt and water. Dirt finds entrance to the milk in many ways; perhaps most frequently it falls into the pail while the milk is being drawn. Every time the udder is jarred by the hand, or the hair on the thigh and side is disturbed by the arm or the motion necessary in milking, particles of dirt, epithelial cells, and hairs are loosened, and many of them fall within the pail, bringing with them myriads of germs of numerous forms. When animals remain in the stable all the time, or are confined to the ordinary barnyard, they become covered with loose particles of dirt, and, if they are not cleaned, it is not uncommon to find a large amount of dirt in the bottom of the milk-vessel after the milk has stood undisturbed a short time.

This source of infection may be easily overcome. Farmers often think that the horse must be well cleaned, but it makes little difference with the cow; this is a great mistake. Cows should be groomed daily, and before they are milked the udder and surrounding parts should be carefully cleaned and wiped with a damp cloth, so that the particles of dirt and bacteria that remain will adhere to the animal and not be so easily shaken off, as is the case when they are dry. It is also important for the milker to be clean. Hands should be carefully washed and overclothes used for no other purpose should be put on before milking is commenced. At the Experiment Station in Wisconsin the effect of cleanliness on the part of the cow and milker has been shown. It was found that under ordinary conditions the number of bacteria deposited per minute in an ordinary-sized milk-pail during milking was over 16,000, while this number was reduced to about 2500 when the precautions just described were taken, a reduction of 85 per cent. Many similar experiments prove the importance of having cow and milker both clean.

Improperly cleaned dairy utensils are another prominent source of milk-infection. Old, worn, battered pails and cans should be discarded, as they cannot be thoroughly cleaned, and those used for carrying milk should be used for no other purpose, nor should they be allowed to remain in the stable when not required there. Vessels are frequently washed by agitating water in one and pouring it into another, continuing this even after it becomes cool and unfit for use. They should be carefully cleaned in hot water, rinsed in clean water, and sterilized with live steam or boiling water. Russell has found that milk taken in sterile pails contained but 165 germs per c.c., while that in unsterilized pails taken under the same conditions contained over 4000 germs per c.c. The sterilization of milk-utensils should be universally practised; it takes away danger of infection by pathogenic and non-pathogenic bacteria that may remain after washing or have been introduced by the rinse-water.

Germ-laden air is responsible for many bacteria obtaining entrance to the milk. When hay or any other dry fodder is fed much dust arises from it, and the number of germs falling within a space the size of the opening of an ordinary milk-pail may be over 150,000 per minute. It is, therefore, important to use such feed-stuffs *after* milking, or to moisten them if they are to be fed just previous to or during milking. The air of cities is often teeming with micro-organisms, and it is liable to contain pathogenic bacteria. For this reason, if for no other, it is essential that

dairies which are to produce pure milk should be located in the country.

The fore-milk is a source of infection not to be overlooked. A little milk usually remains in the teat, and this is easily reached by some of the bacteria from the outside of the udder; all the conditions are favorable to their growth, and they multiply with astonishing rapidity. Usually the germs in the teat represent few species, but the number of individuals is very great, and they may infect all that is drawn into the same vessel as the fore-milk. Shultz has found almost 100,000 germs per c.c. of fore-milk.

It was found that milk as ordinarily taken contained over 15,000 bacteria per c.c., while with the precaution above suggested there were less than 350 in the same volume, or a diminution of about 98 per cent. Thus it is seen that the number of germs entering milk can be largely controlled by observing cleanliness in every detail of the work.

The rapid cooling of milk is of equal importance. After it has been drawn it should be immediately cooled to 45° F., or lower, to check bacterial growth. If this is not done, it will soon contain as many organisms as it would under ordinary circumstances, and the extra care that has been exercised will be wasted. Each pailful should be cooled as it is emptied, and not allowed to remain warm even ten or fifteen minutes until a can is filled. In the best-conducted dairies special stress is placed on the cooling of the milk; in some cases it is at a temperature of 40° within fifteen minutes after it has been drawn from the cow. Spores require a higher temperature for germination than is necessary for the growth and multiplication of germs. So if milk is cooled immediately, it will be quickly brought to a temperature at which the spores falling into it will not germinate; but if cooling is slow, many spores will have ample time to germinate while the milk is still warm and rapidly reproduce at the lower temperature at which they would not have been affected.

Non-pathogenic germs have been referred to chiefly; but if the germs of a contagious disease are in the neighborhood of a dairy, they may be conveyed to the milk exactly in the same way as the harmless ones. The cow herself may be a source of contamination. If she is diseased, germs may be found in the milk in the udder. Germs of tuberculosis are transmitted from the animal in this way, also those of diphtheria, scarlet fever, and foot- and mouth-disease. Guillebeau conducted a series of experiments in which he examined the milk of seventy-six cows suffering with

inflammation of the udder, and in each case he found the milk to contain bacteria which produced, by inoculation, similar trouble in healthy animals. The bacillus of tuberculosis is probably the pathogenic organism now most to be feared in milk; this insidious disease has attracted much attention from physicians, veterinarians, and lawmakers. The number of cattle infected with it is variously estimated at from 2 to 10 per cent. Bang and Ernst have shown that cows having general tuberculosis, but no disease of the udder, may produce milk infected with the bacillus tuberculosis, and other authorities concur with them. All agree that it is not safe to use the milk from cows whose udders are affected by tubercular disease. The physical examination for tuberculosis is not reliable, and it is difficult to detect the presence of these bacteria by microscopic examination, and inoculation experiments are slow. Many large herds may be found that have been examined with the aid of the tuberculin-test, which is now considered the best proof of the existence or non-existence of tuberculosis. The bacilli of tuberculosis are not as easily killed as those of most other diseases. They are not affected in the alimentary canal, and a temperature of 150° for about an hour or 160° for fifteen minutes seems to be necessary to kill them.

Other sources from which pathogenic bacteria are derived are sick persons who attend the animals or have care of the milk. Typhoid fever is, perhaps, the most prominent of these diseases, and quite a number of outbreaks supposed to have been caused by infected milk are recorded. Busey and Koben report the circumstances of an outbreak at Stamford, Conn. In 1893 there was an outbreak of thirty cases of scarlatina in Glasgow, and it is described by Busey and Koben as follows: "This epidemic was traced to the milk from two dairy farms. At one of these a boy simply suffered from sore-throat which induced scarlet fever in others. At the other farm some of the dairy employes developed scarlet fever and had kept at work for one or two days after illness." Twenty-eight cases of diphtheria occurring at Hightstown, N. J., are referred to as follows: "These cases occurred within one week and were all traced to a milk-supply derived from a farm where a German boy assisted in milking while he had diphtheria."

Although it is true that the common bacteria of milk are not pathogenic, some of them by their growth may produce poisonous toxins, and when they are present in large numbers serious results upon the consumer may be produced by these products. Cholera infantum and other intestinal troubles are often attributed to this cause.

With all these facts before us, we would say that the following are the chief things to be observed in establishing a dairy plant:

Any animal suffering from any disease, or not in a normal condition, should be excluded from the herd.

The pastures should be free as possible from foul, decaying animal or vegetable matter. The cows should not have access to swampy ground or any place where they may become unnecessarily befouled.

The stables should be constructed with a view to the comfort and health of the stock and the convenience of the employés. They should be on elevated, well-drained ground, and lighted and ventilated in the most approved manner. The waste-products should be frequently removed, and the feed should be kept apart from the stock-room. No waste-products should be allowed to accumulate in the vicinity of the building.

The water-supply should be abundant and pure, and obtained from deep wells when possible. Springs, brooks, and shallow wells may easily be contaminated, and water from them should be used with caution.

No unwholesome foods should be used, nor any that has begun to putrefy or spoil. Any feeding materials that might impart an objectionable taste or flavor to the milk should be avoided.

The dairy-house should be located and constructed with the same care as the stable. The drainage needs special attention.

The animals should be sheltered at all times when the weather might be prejudicial to their health. They should be cleaned every day, and made comfortable at all times. Kind treatment is imperative, and the milk from any animal in an excited condition should not be used.

Milking should take place in a clean, well-ventilated building, and the milk should be drawn in a cleanly manner by tidy attendants. The vessels should be clean and sterilized. The milk should be strained through fine-wire mesh and cloth and cooled, and held in a place free from contamination at a temperature not exceeding 50° F. It should be served in glass jars which have been thoroughly cleaned and sterilized.

It has been suggested that the place where the improvement of the milk-supply should begin is on the farm, and improvement should be made at each step from the farm to the consumer. Intentional fraud and negligence are less to be feared than ignorance, hence education is one of the chief remedies to be sought. A good start toward educating dairymen has already been made by the establishment of dairy-schools, one being located in every State

where dairying is a prominent industry. Courses are given at these schools in the winter and continued from six to twelve weeks in all, all the time being devoted to the study of dairying and closely allied subjects, such as the selection, care, and management of the dairy herd, the composition of milk and its products, the manufacture of butter and cheese, dairy chemistry and dairy bacteriology. Young men who have taken these courses are now connected with firms supplying milk to cities, and this special training has proved to be of much value to them and to their employers.

Dairymen and others will gradually learn to use greater intelligence in the production and handling of milk. They will learn to cover their field more perfectly than most of them do at present, and the veterinarian will be called upon more frequently for assistance.

The consideration of pure milk and aid in obtaining it seems to fall naturally to veterinarians. They are concerned with animals and their products. On account of their profession they understand the functions by which milk is produced and know something of its nature; being interested in the general health of a community, they should assist in having pure foods. And from a business standpoint it is to their interest to have the milk-consumption as large as possible.

As suggested above, one of the chief agents which has acted to increase milk-consumption has been the increased confidence of consumers. What can better serve this end than for them to know that the dairy, the stock, the surroundings, and the methods of conducting the work are carefully and frequently examined by a competent veterinarian who has made milk a special study? A veterinarian is already qualified for this work, though it may be advisable for him to brush up a little on the question of bacteriology, with special reference to the dairy.

Special attention should be given to prevent the entrance of pathogenic germs to the milk, and frequent examinations of the animals, employés, and surroundings of the dairy should be made. An examination of the herd in the field is not sufficient—every individual cow should be examined; the health of the employés and their families should be ascertained, and other things requiring attention, and feed, water-supply, the conditions of the stable and its ventilation, the milk-room, milk utensils, and methods of handling milk.

A good start toward supplying our cities with sanitary milk has been made. In almost all large towns it is possible to obtain

milk that is produced on scientific principles. But places that can be thoroughly relied upon are yet few. They have many obstacles to overcome; one of them is the ignorance of many persons as to the value of pure milk. Some form of dairy inspection whereby the public may have full knowledge of the conditions under which the milk it consumes is produced is recommended. Various methods are followed in European countries and in the States. It is believed that one of the best systems has been inaugurated in New Jersey, and the milk from the dairy in question is termed "certified," as a body of experts certify that it is pure. A number of physicians interested in improving the milk-supply of their city have drawn up a contract with a dairyman which provides for the proper conduct of every part of the business; it specifically states the points upon which special importance is placed relating in detail to the duties of the dairyman.

The following section from the proposed contract is the one relating to the surroundings: "It is further understood and agreed that the immediate surroundings of the building shall be kept in a condition of cleanliness and in order. There shall not be allowed to accumulate in the vicinity any loose dirt, rubbish, or decayed vegetable or animal matter or animal waste, nor shall there be within three hundred yards of any building any constantly wet or marshy ground or stagnant pools of water; nor shall there be kept within three hundred yards of any building used for dairy purposes any fowls, hogs, horses, or other live-stock."

The physicians of the commission serve without compensation; they employ a veterinarian, a bacteriologist, and a chemist to examine the dairy and milk at certain intervals, and the reports of these experts are printed, all expenses being paid by the dairyman. As samples of milk for examination are liable to be taken from the wagon at any time, the reputation of the dairyman is constantly at stake. Milk produced under these conditions and placed on the market with the recommendation which it carries commands an extra price, which is willingly paid by those who appreciate its value, and is necessary on account of the increased cost of production.

Whether or not the plan could be successfully followed in other cities is uncertain. In the place referred to there had been an outbreak of typhoid fever which was traced to the milk-supply, and physicians and all citizens were alike aroused to the importance of radical reforms. In many cases a modification of the plan might be adopted; the Board of Health, or a committee appointed by

them, might take the place of the medical board, and milkmen desirous of receiving the indorsement of this body should conform to their regulations and pay all expenses of the experts, who would make inspections and reports as often as requested by the board. Such a system could be conducted without expense to the community, and, being voluntary on the part of the dairyman, those who go into it should receive full benefit of it, such as privilege to make use of the experts' reports. It would be necessary to be very strict in regard to the conditions imposed and failure to comply with them.

There are about 17,000,000 cows in this country. It is estimated that 5,000,000 of them, whose annual product is valued at \$150,000,000, produce milk for direct consumption. The task of improving this tremendous product is very great, and as there seems to be no one better qualified to assist the dairyman in the work than the veterinarian, it is most appropriate for the subject to come up for discussion in your meeting. I earnestly hope that greater interest may be awakened and some good accomplished by to-night's discussion.

THE EXAMINATION OF HORSES FOR SOUNDNESS.¹

BY H. D. HANSON, D.V.S.,
NEW YORK CITY.

THE subject of the examination for soundness is not a new one to you, but, as it is very interesting as well as important, I have selected it in order to try to excite discussion and bring out some of the important points that I have only touched upon or have omitted. My paper is short, being only a rough outline of the subject, as time will not permit a lengthy discourse.

In my opinion, the subject of the examination for soundness ought to be considered by veterinarians as follows: First, theoretical soundness; second, practical soundness.

Theoretical soundness rarely, if ever, exists, which should be remembered in making our examinations. This being the case, we, as veterinarians, have to be contented, and are compelled to make use of the term "practical soundness," which should be defined to be that condition existing which is the nearest approach to a perfectly sound horse.

¹ Read before the Veterinary Medical Association of New York County, March 3, 1897.

Before proceeding any further, it is well to understand the meaning of "soundness." In defining a sound horse it becomes necessary to combine in a few words that which is difficult or almost impossible, as a complete definition and explanation would consume many pages.

Suffice it to say that a sound horse is one that is free from all disease and has nothing about him that interferes or is likely to interfere with his usefulness, or depreciate his value as a sound horse.

Taking the above definitions and the conditions really existing in practice, what do we find, and how are we to proceed?

In the first place, we find that theoretical soundness rarely, if ever, exists; second, that practical soundness is what we have to deal with; third, that a horse must be free from all disease that renders him unable to do his kind of work as a sound horse should; fourth, that certain conditions may be present which, in a longer or shorter time, are likely to render him unfit to do the work of a sound horse; fifth, that nothing must exist that tends to depreciate the value of the animal as compared to a sound horse; sixth, that we, as veterinarians, ought to examine carefully and conscientiously, taking into consideration the class of horse (whether a smooth-limbed, well-bred animal, or whether a common-bred, rough, and big-boned animal), as well as the kind of work the horse will have to do; seventh, that we, as veterinarians, have our reputation at stake; eighth, that we must do our duty to the buyer who employs us; ninth, that we should not be prejudiced against the seller; tenth, that in acting fairly for ourselves we will do our duty to all concerned.

How are we to proceed to examine the animal? We must bear in mind that a horse may be temporarily unsound and permanently unsound.

Temporary unsoundness may include certain diseases, of which, after the animal has recovered, little or no trace remains; it also includes certain forms of lameness, as interfering, slight sprains, etc., which subside in a short while. In our examinations we should look for disease, malformations, etc., and not for soundness.

The horse to be examined should be seen, first, at rest, in and out of the stall; second, in motion, both when warmed up and when cooled off (that is, examined in motion while hot and also when cold).

While at rest in the stall we may ascertain how the animal feeds—if he cribs, sucks wind, weaves, his position of standing, etc.;

when backing out of the stall, the movements, whether there is dragging of the feet, or other peculiar actions.

On the floor, have the animal naked (nothing on but a halter). Now take a general glance at the animal, noting the position of the extremities, the color, size, and general outline. Then proceed to examine part by part, commencing at the head and not forgetting to compare one side with the other as you go along.

In examining the head note the shape, the conditions of the bones of the face, the shape and condition of the eyes, the pupils, the ears, the mucous membranes of the nasal cavity (looking at the color, for ulceration, growths, etc.); then examine the contents of the mouth, the age, the shape, size, and wearing surfaces of the teeth, and examine the bars for fractures; next pass to the inter-maxillary space, feeling the pulse, the condition of the lower jaw, whether thickened or thinned; the glands in this region, then the poll, the throat, the condition of the glands, not forgetting to cause the animal to cough and remembering the kind of cough; passing along the neck, the condition of the mane, the jugular groove, the trachea; the shoulders for marks of setons, wasting of muscles; the elbows (for capped elbow); the knee for fractures, inflammation, etc.; the shin-bones for splints; the tendons (for their condition); the fetlock for fractures, swellings, scars of neurotomy, etc.; then look for side-bones, ring-bones, etc.; now the general outline of the feet, as regards size, shape, etc., and in particular for toe-cracks, quarter-cracks, results of laminitis, navicular disease, etc.

Next the body comes under our observation, remembering to examine both sides; first the withers, looking for marks of setons, swellings, etc.; then the condition of the ribs; auscultate the heart and lungs; then pandiculate, looking at the abdomen for hernia, etc.; the flank, noting the respirations, whether quickened, slow, irregular, and the like.

Next place yourself behind the animal, examining the hips for fractures, swellings, etc.; then the hip-joints (remembering to compare one side with the other); now examine the tail to see if false; look about the anus for tumors; the inguinal region for hernia, tumors, etc.; the stifles (for swellings, dislocations); the hocks (for spavins, thoroughpins, curbs); then pass downward, noting the condition of the parts as in the anterior extremities. While here do not forget to take the temperature.

Now have the animal trotted by the halter in as straight a line as possible in a slow, easy trot, allowing it about one foot of rope,

so as not to interfere with the action ; the animal should be trotted from you, at which time you note the movements of the posterior extremities, and when trotted toward you the movements of the anterior extremities.

It is also well to have the animal turned both ways, so as to see if any signs of stringhalt exist.

When the animal is warmed up lameness may not be shown, while if cooled off it manifests itself, and *vice versa*. Next have the animal galloped to test his wind; see if the breathing is fast, irregular, or noisy. Do not forget to examine the eyes with the ophthalmoscope.

I have given you a rapid sketch of the examination, but there still remains another very important part, which is the writing of a certificate.

What ought a certificate contain? It ought to contain the age, sex, height, condition of the mane and tail, and any special peculiarities or marks that may exist, the latter identifying one horse of the same color from another. If an animal be unsound, the cause of lameness, etc., may be mentioned in the certificate.

The following is the usual form used and adopted by Prof. Liautard:

This is to certify that I have examined this day, at the request of Mr. _____, a chestnut gelding, six years old, fifteen and a half hands high, clipped mane, full tail, white star on forehead, low white stocking on near foreleg, high white stocking on off hind, and find said animal to be lame on the near hindleg from a spavin, and therefore unsound, or have failed to find any unsoundness.

The foreign demand for American-bred horses continues to enlarge, and almost every great selling centre of our country has representatives of foreign countries buying for export. The enhancing values of good horses may in a measure limit the sale in this direction.

Two notable features of the recent carriage exhibition at the Philadelphia Bourse was the absence of any horseless vehicles and a specially designed carriage for Veterinarian Charles Williams, with an electric headlight for the top, self-oiling axles, and a medicine-drawer, with compartments, which slides out of sight under the seat. It follows somewhat in design the Jenny Lind style.

ABSTRACTS FROM FOREIGN JOURNALS.

GERMAN.

UNDER THE DIRECTION OF J. PRESTON HOSKINS,
PRINCETON, N. J.

DIAGNOSTIC WORTH OF MALLEIN AND TUBERCULIN. Prof. Semmer gives the result of the numerous tests of mallein which were made under his direction during the year 1893-'94. In all 952 horses were subjected to the test, and in 561 of these a rise in temperature of 2° to 3.5° C. manifested itself. All of the 391 cases which did not react remained well, and in the few cases where post-mortems were held no symptoms of glanders (strangles) could be detected. In the 157 cases in which a rise of temperature took place post-mortems were also held on two animals without result; in all the others, not a single one of which showed external symptoms of the disease, the specific lesions were found; they were not, however, very characteristic: swelling of some of the lymph-glands internally with indurations, little ulcers, thickening of the mucous membrane of the nose, etc. In almost all cases fresh, soft, gray-colored granulations were found in the lungs, which sometimes were in a condition of cheesy degeneration. It often costs much trouble and care to trace out the pathological changes. These characteristic symptoms and the frequency of their occurrence, especially in southern Russia, led Semmer to the conclusion that this form of the disease was a mild strangles. The animals frequently recovered, and the bacteriological investigations gave, for the most part, only negative results. Semmer regards mallein as the surest means of diagnosis in strangles, rendering it possible to detect the disease in its mildest and most latent form. He considers tuberculin also as a valuable diagnostic means, and recommends its general use.—*Veeartsenij. Bladen*, Deel ix. Heft 4.

ESTABLISHMENT OF A VETERINARY INSTITUTION IN PRAGUE. At the session of the Bohemian Landtag of January 17th the following resolution of Representative Dworals, concerning the establishment of a veterinary institute, came up for first reading: That the Provincial government be authorized to enter into negotiations with the Imperial government, in order that a Bohemian veterinary institute may be founded in Prague, to fill the long-felt want in the

kingdom of Bohemia of veterinary surgeons thoroughly trained in all the practical departments of the science. In speaking of the measure Dr. Dworals dwelt upon the necessity of prolonging the course to four years. The final aim of veterinary medicine is not merely to protect the live-stock which the nation possesses, but also to protect humanity from the baneful influence of epidemics among the domestic animals. For this, not empiricism, but the most exact science is necessary.—*Thierärztliches Centralblatt*, February 15, 1896.

DEMAND FOR THE REORGANIZATION OF VETERINARY STUDIES IN LOWER AUSTRIA. At the session of the Lower Austrian Landtag of January 21, 1896, a resolution was adopted urging the government to begin at once the reorganization of veterinary instruction, by means of which special regard may be paid to the training of veterinarians for the treatment of the diseases of domestic animals, especially cattle and swine. The representative of the government replied that a scheme for such reorganization had already been prepared and would be gradually carried out. He admitted that the veterinary institutes had heretofore paid almost exclusive attention to horses, but during the last few years cattle and swine diseases had been receiving more and more attention.—*Thierärztliches Centralblatt*, February 15, 1896.

SOCIETY NEWS. After the business session of the Lower Austrian Veterinary Society in Vienna, January 23d, the members accepted the invitation of Prof. Josef Bayer to visit the new clinic of the Veterinary Institute, where the following interesting cases had been prepared for demonstration: 1. Operation on a horse with radiating cancer, which had been under treatment for six months. 2. A plastic operation on the root of the front foot of a horse. 3. Cataract caused by artificial conditions, total on the left eye and nail-shaped on the right. 4. Congenital cataract on both eyes. 5. Huge melanotic tumor on the right cheek of a gray horse. 6. Breaking of the muscles on the under part of the right thigh. The demonstrations were received with great applause.—*Thierärztliches Centralblatt*, February 15, 1896.

URTICARIA OF THE HOG. Having made a study of this malady, M. Guittard thus gives the symptoms useful in the differential diagnosis of urticaria, rouget, pneumo-enteritis, and anthrax in the hog:

Urticaria: The cutaneous spots of a brownish color, not con-

fluent, well-defined, situated upon the back, the neck, the lateral parts of the body, and the rump. A moderately pronounced fever; anorexia; no diarrhœa. Termination of disease usually satisfactory. Attacks young animals especially, and is not very fatal.

Rouget: Cutaneous spots of a mottled, violet color, poorly defined and widely extended, on the ears, the neck, beneath the belly, on the flanks, and extending often over one side of the body. A very pronounced fever; evolution very rapid. The diarrhœa is serous and sometimes bloody. Respiration very much accelerated. Complete anorexia. Termination almost always fatal. It attacks only animals of adult age.

Pneumo-enteritis: Attack and development gradual; prostration pronounced; flatulency; constipation at the end, then a fetid diarrhœal discharge mingled with blood. Cough, throwing up, with difficulty of respiration. Hemorrhagic and œdematous spots on the ears, the thighs, and beneath the belly. Attacks animals of all ages, and is very fatal.

Anthrax: Diffuse congestion under the throat; œdematous, mottled with violet, and increasing rapidly. Œdema on the surface; deglutition difficult; general weakness; diarrhœa developing very rapidly. Asphyxia threatening. Death almost certain. Occurs very rarely.—*Annales de Méd. Vét.*, March, 1896.

REPORTS OF CASES.

LIPOMA CAUSING DEATH.¹

BY J. F. ROUB, D.V.S.,
MONROE, WIS.

THE patient was a dark-brown gelding, sixteen hands high, and nineteen years of age, weighing 1200 pounds, and used for a carriage-horse; never known to refuse his food and never had a sick day previous to the time I was called to see him. Upon examination I found the pulse almost imperceptible; temperature 103° F.; perspiration bedewed the cutaneous surface; visible mucous membranes somewhat injected; peristalsis normal; and the feces were normal in appearance. The horse was suffering excruciating pain.

¹ Read before the meeting of the Wisconsin Society of Veterinary Graduates, Madison, February 5, 1897.

The pain was continuous and presented the characteristic symptoms of enteritis, and I informed the owner that his horse would probably die. It being only a short distance from my hospital, I had the animal taken there. This was at 8 A.M. I began treatment by giving opiates and anodynes in large doses, but all to no avail. The horse continued to roll and thresh about until he was nearly exhausted. At 1.30 P.M. I gave morphine sulph., gr. v., hypodermatically. At this time I informed the owner that I was mistaken in my diagnosis, as it would be impossible for the horse to have enteritis and peristalsis continued for five hours and a half. I then made a rectal examination, but discovered nothing that would lead to a true diagnosis. Being at a loss as to the cause, I waited for further developments. At 2 P.M. the horse grew quieter and seemed almost free from pain. At 3 P.M. he rolled a few times, and then lay in a recumbent position, partly comatose, for about four hours. At 8 P.M. pulse imperceptible; a cold sweat bedewed the body; extremities cold; haggard expression of the countenance; tremor of pectoral muscles; staggering gait; temperature 98° F.; intestines paralyzed. At this point I was sure I had a case of enteritis, but did not inform the owner. There was not much change in the symptoms until 8 A.M., when the patient grew much worse and died at 9 A.M.

The animal was taken out two and one-half miles, and the autopsy revealed a lipomatous tumor resembling a large apple, measuring four and one-half inches in diameter; the pedicle was three-eighths of an inch in diameter, being attached to the posterior aorta three inches posterior to the lesser mesenteric artery, causing pressure on the aorta sufficient to diminish the calibre of the vessel three-fourths. This caused infiltration, and there was a black, gelatinous mass, varying from one-half to one inch in thickness and covering a surface of twelve to fifteen inches, also extending down the lesser mesentery about eight inches. The intestinal tract and all the other internal organs were in a healthy condition.

HYSTERIA—DOG.

BY H. W. SMITH, V.S.,
MISSISSIPPI.

I WAS called to see a dog said to be mad. It was a fox-terrier, and said to be of high pedigree. It was noticed at play chasing birds, etc. After a time it seemed to be taken with a fit of bark-

ing. The dog was caught and put in a stable. A druggist and several others were called, who pronounced the dog mad. On my arrival I noticed that the dog did not appear to be in any way vicious, but was acting in a manner that any well-pleased dog might be expected to do—running around the stable, jumping up the wall, barking and wagging its tail all the time. I was told that he had acted in that fashion for three hours, during which time he had not stopped barking once.

I stated that in my opinion the dog was simply overexcited, not mad—in fact, that it had hysteria, and prescribed chloral hydrate, grs. x. The effect was almost immediate calmness. I left a dose of ten grains, to be given in half an hour.

EDITORIAL.

GO SLOW, MR. SECRETARY.

SECRETARY WILSON, in listening to the spoilsmen of his party in their wail for public place, should occasionally step outside the atmosphere of Washington and learn the feelings of those who have welcomed the establishment of the merit-system in the Department of Agriculture as the wisest and most advanced movement ever inaugurated in that department of our government. He should know that the veterinary profession have spoken through their associations and organizations in behalf of the value of the merit-system of appointment. He only need ask of those who have entered this service by this method how much they appreciate its value and worth, and how many of them have only relinquished private practice to enter the Government service because of the feeling of security that the merit-system promised to those appointed under its rules. He only need seek for an expression of opinion from one and all of the veterinary colleges of North America, which have the true education of veterinarians at heart, to learn of the appreciation of the change inaugurated by Secretary Morton, and which, for the first time, gave impetus to a movement that found in the colleges an additional interest in governmental scientific work, and thus increased the special training required to more properly fit men for such work. He need only ask those whose positions will afford an unbiased expression of opinion as to the value of the work done to-day ; the efficiency with which it is performed,

and the character of the men in this branch of the public service as compared with the days of the "spoils system" in that department. Step into any former working centre of the department under the old system, and hear the stories of the good times when "party pull" was the entré and chain of security to place, and then compare it with one of these centres of work of to-day, where earnest, efficient attention to work and true scientific interest and zeal are displayed in the effort to discharge a sworn duty in the interest of the public service. You need not hide behind one requisition, Mr. Secretary, that brought you a youth for some service in which you preferred age and experience. Nor must this be a barrier for entrance to the public service, for the schools of to-day are equipping their scholars for these positions much better than the experience alone of the past twenty years has taught.

The service in this department was never better performed than during the past three years; the value of the work never so commensurate with the cost of the same. The extension of the work in every wise and profitable direction will find no opponents among those who have best studied its importance; but every step upon your part to return this department to the prey of the hungry horde of spoilsmen who follow in the wake of party success, and whose chief aim is to feed at the public crib, will bring only such results as will rob your administration of its high character, lower the standard of the work of your department, and lessen the interest of every true supporter of this work—collegiate, association, and individual. We sincerely trust that better judgment will prevail; and we repeat, "Go slow in this direction, Mr. Secretary."

NOT ALWAYS A WISE PROCEDURE.

THE rapidly changing conditions of the times, calling to the aid of cities, towns, and boroughs, the assistance and aid of milk- and meat-inspectors, associated with the progressive movements of health and sanitary boards, have found, in many instances, that this field of work had not been properly cultivated, and a lack of education of the public has not created a discerning recognition of those best equipped to fill such important positions. By training, education, and association there is no one so well prepared to discharge these duties as the educated veterinarian. No layman, no butcher, no cattle-breeder or owner can, under any circumstances, discharge properly the duties of such positions; neither is the

mere graduate of human medicine, without long experience and a knowledge of the domesticated animals, gained by observation and training, so well equipped to fill such posts. But it is of the layman we wish to speak more especially, and to say to our colleagues, when seeking these positions, that they must not forget that their services are much more valuable than those of a layman. It is trained skill of a high order they are offering, and, in the race for place or in the zeal to dislodge an unqualified person from such places, the veterinarian must not forget the greater value of his services and that a more fitting compensation should follow. To offer scientific, technical skill at little cost, or the throwing out of bargain-counter inducements is not always a wise procedure, and proves often a two-edged sword by first affording an inadequate compensation for work which should be properly and conscientiously performed; and secondly, fixes a low rate of compensation for similar services in other cities and towns, thus injuring all who may be desirous of elevating the profession.

THE Wyoming Valley Veterinary Medical Association passed strong resolutions and charged their officers with the duty of protesting against the proposed reopening of the Act of 1889, governing the registration of non-graduates in Pennsylvania. This association, in conjunction with members of the State Veterinary Examining Board, will press to an ultimate decision several violations of the laws governing the practice of veterinary science in Lackawanna County.

THE death of so many cattle and sheep on the Western ranges from the severe cold of the past winter has called forth a stinging rebuke from Prof. Thomas Shaw, of the Minnesota Agricultural College, to the men whose inhumanity imperilled the lives, not to speak of the suffering, of these animals, by placing them in such dangers, without making provision for either food or shelter. The humane societies of our land are strongly called upon to take action concerning this inhuman exposure of animals to such uncalled-for danger and suffering.

THE several proposed legislative acts of interest to the veterinarians of Pennsylvania are making progress. The bill to reopen registrations has not yet been reported from the committee to which it was referred. The bill to prevent the introduction of cattle for

breeding or dairy purposes, except with certificate of freedom from tuberculosis or submission to the tuberculin-test, is well advanced on the calendar, but needs the continued advocacy and support of all those interested in these branches of animal industry. The bill to appropriate fifty thousand dollars for the purposes of investigation of the infectious and contagious diseases of live-stock, so as to arrive at more definite plans of dealing with them, is in the hands of the Appropriation Committee. This bill has won for itself the earnest support of the press, the farmers and dairymen, the veterinary and medical profession, as well as all boards of health and sanitary bodies.

GOVERNOR TANNER, of Illinois, shows little indication of any high conception of the needs of the times, and, in his recognition of a non-graduate for State Veterinarian, gives small encouragement to the movement demanding higher veterinary education in his State by the establishment of a Veterinary Department at the State University.

THE political shake-up in the Kansas Agricultural College, involving the retirement of some fifteen of the trustees and faculty, includes among the number N. S. Mayo, Professor of Physiology and Veterinary Science. Such are the dangers of State Universities which are semi-political in character, and where changes of administration in State government are often followed by changes in the State educational institutions, from which it will take years to recover. Kansas seems to be a cyclonic State in more ways than one.

VERY important plans and experimental trials for better information as to the methods of propagation and spread of tuberculosis are being planned by the State Veterinary Sanitary Board of Pennsylvania. These tests, bearing upon the practical and monetary measures of ^{the} control, will be of the utmost value in dealing with this scourge, limiting its extension and determining the barriers necessary to control its ravages.

THE Bay State Legislature at its last session voted the sum of \$250,000 for the work of the Cattle Commission in stamping out tuberculosis and other infectious and contagious diseases of live-stock within its borders. The changes in the constitution of the

Commission brought to its control and direction two members of our profession whose views, privately and publicly, were antagonistic to those members of our calling who had matured plans for dealing with the scourge of tuberculosis. The whole country waits with impatience to learn of the plans of those now in control; they appreciate the value of the great power in the Commission's hands; they are fearful of the loss of this power if some definite plan and work are not consummated; they realize better, perhaps, the result in other States where smaller sums of money were appropriated and used up in work without method or plan, and they are more than anxious that this work shall not be wiped out or placed in the hands of laymen because our profession is drifting about without plans or distinct purposes in the veterinary sanitary field of work. Much is known about human and bovine tuberculosis, but there is a great deal more to learn before economical plans for its control can be adopted, and these can only be determined by distinct and well-directed experimental work in now well-indicated directions. The country waits and the profession is dependent, in a measure, upon the lead in Massachusetts. The dangers are far-reaching, the burdens are heavy upon those who are carrying them, and we do not want to hear the criticism that such an intelligent body are, Micawber-like, waiting for "something to turn up." Let us hear of your turning up something; let us know of your plans, that others may join you in the common end of it all—relief to all concerned.

NECROLOGY.

LUCIAN T. BELL, M.D., V.S., died on Friday morning, April 16th, the result of failing health, which had been making inroads on his physical condition for the past year.

Dr. Bell was born at Staunton, Va., May 18, 1850, and received his early education in the country academical schools; he graduated from the old New York College of Veterinary Surgeons in 1871, the class of that year consisting of but four students, only two of whom were successful in receiving a diploma. After the establishment of the American Veterinary College he returned, and with some others received the degree of that school in 1876, and in 1880 finished a course in human medicine and received the diploma of the Long Island Medical College. He served under General Patrick in the first crusade against pleuro-pneumonia in 1876, as chief inspector for Long Island. When the Bureau of Animal Industry

inaugurated the movement to suppress pleuro-pneumonia he was again summoned to aid in this work, and served until the Harrison administration. From 1885 to 1894 he was veterinarian to the Brooklyn Board of Health. In 1875 he became a member of the United States Veterinary Medical Association, but relinquished his membership some years later, owing to a very large practice and the care of a model veterinary sanitarium at 358 South Second Street, Brooklyn, E. D. Dr. Bell was a man of spotless integrity, an appreciated practitioner by a very large clientage, and one of the most successful in the city of Brooklyn. A wife and four children are left to mourn his loss, which will be mingled with the sympathy and sorrow of everyone who was fortunate to have enjoyed his friendship and acquaintance.

It is very encouraging to the efforts made by the editorial staff of the JOURNAL to receive the following in a letter sent to the editorial office, and we assure the writer of our sincere appreciation: "The March number of the JOURNAL came promptly to hand, and is replete with articles interesting to all veterinarians. The industry, energy, and untiring perseverance employed in the production of this JOURNAL are little appreciated, I fear, by the casual reader; but everyone who has noted the growth of this and other veterinary periodicals ought to take in it a personal pride and use his best endeavors to increase its subscription-list and its scope of usefulness. I am appalled with amazement when I think of the amount of work given by somebody to furnish me with such a valuable periodical. May the subscriptions justify the outlay of energy."

CORRESPONDENCE.

TO THE BOSS HORSESHOERS' ASSOCIATION OF CHICAGO, ILLINOIS.

GENTLEMEN: As a body of tradesmen you did all in your power to procure for your craft legislation at the last session of the Legislature at Springfield. No doubt you considered well the advantages this legislation would be to owners of stock if such a bill had passed in the favor of your tradesmen; certainly if such a bill had become a law the public were assured that their horses were being shod under the supervision of tradesmen who were qualified, and knew what shoe was required and if the foot was

in a condition to be shod. We are aware that many horseshoeing shops in this city have been run by parties who know nothing about the trade they have entered into, and some parties running around among owners of stock contracting and offering to do work much cheaper than your capable boss horseshoers would think of doing it for, causing you no end of annoyance and loss of customers to many of you, who had earned your knowledge of the business by your many years of apprenticeship and experience under other employers previous to entering into business as a capable and trusty boss horseshoer. Certainly, you gentlemen of the Association thought well of the necessity of the passage of such a bill and what the advantages to the public would be if such would become a law. Gentlemen, in our opinion, your ideas of such a bill were grand. As an Association you had fully realized the necessity of the same, owing to the many parties just referred to starting up places of business and hanging up signs over doors: "John So and So, practical horseshoer." You all considered that such a proceeding was an imposition upon the owners of stock, and you considered a man who was not capable of shoeing a horse ought not to be allowed to represent himself to the public as a boss horseshoer; therefore, the passage of such a bill was necessary for the protection of those who were owners of horses from those unscrupulous men who dared to represent they were capable of doing what they were not. But, again, how many of this Association, who were so very anxious for the protection of the public against such men, state and represent to the public and owners of horses that they are not only boss horseshoers but veterinary surgeons, and capable of attending to all the ills the horse is heir to? As an intelligent body of tradesmen who lately, through your Association, asked for legislation, have you ever considered that those of your Association who, by card and other ways, so wrongfully represent themselves to the public as veterinary surgeons, ought not first to take the mote out of their own eyes? Certainly, gentlemen, your motto is: "Do unto others as we would have others do unto us."

A few practical examples regarding horseshoers acting as veterinary surgeons will call to your mind the fact that we are right in protesting against its continuance. Take "nail wounds," for instance. How many horseshoers are there who will refuse to treat them, telling the owner of the horse that it is the work of the veterinary surgeon to treat it? Do you do this? No. You tell the owner you can fix that up in a day or two. Your treatment (?):

You pour an acid into the wound. You cure a good many cases (?): Yes, if the hole has been so small that the acid did not penetrate into the delicate tissues the horse gets well quickly, provided the germ of lockjaw did not enter with the nail. On the other hand, if the hole was large and the acid enters freely, the horse stays lame until the owner gets disgusted and calls in a veterinary surgeon, who finds one of several conditions—*i. e.*, he enlarges the opening and finds a lot of dead tissue, due to the caustic action of the acid, acting as a foreign body in the foot, keeping up inflammation and pain; frequently upon removal of this, with a day or two of proper treatment, the animal goes sound. Another and more common condition we find is pus being discharged from around the coronet, due to the kind horseshoer stopping up the nail-hole either by the use of the acid, which swells the tissues, or from the aforesaid dead tissue acting as a plug, which prevents the free discharge of pus from the bottom of the hoof. Consequently it works upward, and either greatly prolongs the misery and uselessness of the horse or results in his destruction entirely.

Gentlemen, we will ask you, up to a few months ago, until the founding of your worthy school, how many horseshoers knew how many bones there were in a horse's foot or anything whatever about the blood- and nerve-supply? What do you know about germs—such microscopic germs as cause tetanus (lockjaw), blood-poisoning, and numerous other diseases? What do you know about antiseptics or germ-destroyers? About, say, the pathology of even a nail-wound?

Would *you*, if you stepped on to a nail, go to the man that made your shoes to treat it? We find the same horseshoers who cannot tell us how many bones there are in a horse's foot frequently, yes, daily, dispute with us regarding the location of lameness, usually locating it in the shoulder, the most powerful part of the leg and most free from sprains, overlooking entirely the tender part, especially below the knee and more especially the foot; overlooking entirely the fact that the slender tendons below the knee or complicated joints are more prone to a sprain than the powerful muscles of the shoulder.

Again, take the foot. Few can understand how lameness can exist in it when it is apparently a perfect foot. Yet it can, to external appearances, be a perfect model of a hoof and still be the seat of the malicious navicular disease, or, possibly from an old nail-prick, there is a bulging of horn or perhaps a small growth of bone impinging upon the sensitive structure of the hoof, etc.

Aside from nearly all who make it a point to treat nail-wounds and lameness, there is the horseshoer who is so elated over his smartness that he gets cards printed: "John Jones, veterinary surgeon;" and perhaps he buys a float, and then he is a veterinary surgeon and dentist. What are his qualifications? He has rubbed up against horses a number of years and is the proud possessor of perhaps Kendall's *Spavin Cure*, *Horse-Doctor Book*, or some similar quack-book.

What does he know? Does he know anything even about the first principles of practice; that is, the pulse and temperature? For instance, a member of this Society a few weeks ago was called to a sick horse. The first thing done was to feel the animal's pulse; from its condition the owner was informed that the horse would die inside of twenty or thirty minutes, when the horseshoer veterinary surgeon stepped up and said: "Doctor, that's also what I think." Upon hearing this the owner spoke up, saying to said quack: "What the d——l do you mean? Only five minutes ago you told me the horse was getting better and could go to work to-morrow." Our member then found that the said horseshoer veterinary surgeon had been treating the animal for a disease he did not have and giving medicine that, under the circumstances, acted as a deadly poison to the horse.

The men of this class know nothing regarding the intricate action of drugs, of their indications or contraindications in disease. They only know about five diseases and about so many prescriptions copied out of a book written by a man equally as ignorant, for the reason that the man who is content with such knowledge is too ignorant to comprehend the meaning of the language in first-class veterinary works, and yet the woods are full of horseshoers who usurp the duties of the veterinary surgeon. Such men are an injury to yourselves, a detriment to the uplifting of your calling, an injury to the horse, and an enemy to the public. As long as such men exist, so long will your calling be relegated to the ranks of the ignorant. It is your duty to shoe a horse, know when and how to shoe him properly, and correct such faults of the locomotory apparatus as can be corrected by shoeing, and leave the doctoring to those men who are qualified and have studied specially to do so; men who are graduates of recognized veterinary colleges and understand every department of the horse's body, together with its ills and pains, as well as proper treatment.

Gentlemen, we ask you to consider the foregoing statement carefully. Consider it as a friendly argument, coming from your

friends, and not from enemies. We are your friends, for how often do we find an animal lame from a nail-prick while being shod; and we invariably, where the owner does not know otherwise, cover the error by not mentioning the real cause, or, where he does know, we help you out and save the customer for you by explaining that such occurrences are due to the nail bending on account of being a little softer or thinner at one part than it should be, or striking an extra hard spot in the wall or a piece of a nail which has remained imbedded in the wall. What return do we get for this kindness?

Gentlemen, we will close by asking you to let doctoring alone. Live and let live. Wishing you success in getting your bill on legislation passed, we remain,

Yours respectfully,

LAWRENCE CAMPBELL, D.V.S.,

Secretary Chicago Veterinary Society.

CHICAGO, Feb. 12, 1897.

CONTROL WORK.

Pennsylvania. Troy, Athens, Towanda, and Canton have notified all milkdealers through their local boards of health that all animals furnishing milk for the citizens of these places must be inspected by competent veterinarians and be free from tuberculosis.

Missouri. *Bulletin No. 37* of the State Experiment Station records the results of some interesting experiments bearing upon the transmission of Texas-fever by the ticks. Ticks hatched in the laboratory and placed upon some Missouri short-horn cows in lots free from any possible infection resulted in fatal cases of Texas-fever in from thirteen to eighteen days. Some dipped cattle from the Texas Experiment Station (West Virginia mineral oil being used) were sent to Missouri and placed among some susceptible short-horn cattle from August 13th to November 1st without the development of any symptoms of Texas-fever. Some inoculation experiments have been made which promise very well and which may prove a thorough and inexpensive solution of this problem.

National. Secretary Wilson, of the Department of Agriculture, has determined upon plans looking to the eradication of hog-cholera. Several centres of work in this direction will be established, where

the coöperation of the people may be secured. The Government will assume the entire charge and the expense incidental thereto, and pay for all hogs killed at their pork-value. Careful microscopic and chemical examinations and analyses will be followed with the hope that results may be obtained which will warrant a general effort in this direction another year.

Nevada. This State will have to raise up barriers of protection at an early date or she will find her people burdened with an additional load beyond the ability of the agriculturists of any State to sustain. We refer to the recent sale into that State, by a well-known breeder in the East, of two carloads of thoroughbred cattle from a herd known to have tuberculosis among them, and the progeny of which the owner found it difficult to sell at home without subjecting them to the tuberculin-test and the production of a certificate showing the animals to be free from tuberculosis. The date is rapidly approaching when interstate inspection must be established and a greater security furnished our stockraisers and breeders from these controllable sources of danger.

BOOK REVIEWS.

LEHRBUCH DER VERGLEICHENDEN PATHOLOGIE UND THERAPIE DES MENSCHEN UND DER HAUSTIERE, FÜR THIERARSTE, ARZTE, UND STUDIRENDE. von DR. GEORG SCHNEIDEMÜHL, Privat Docent der Thiermedizin an der Universität, Kiel.

TEXT-BOOK OF THE COMPARATIVE PATHOLOGY AND THERAPEUTICS OF MAN AND THE DOMESTIC ANIMALS, FOR VETERINARIANS, PHYSICIANS, AND STUDENTS. By DR. GEORGE SCHNEIDEMÜHL, Instructor of Veterinary Medicine at the University of Kiel. Vol. i., 1895. Vol. ii., 1896. Published by Wilhelm Engelmann, Leipsic, Germany. Price, vol. i., 5 marks (\$1.25). Vol. ii., 6 marks (\$1.50). (Vols. iii. and iv. to follow.)

THIS book is intended to be a manual for teachers, investigators, and practitioners, from which they can gain all necessary information in regard to the many questions of veterinary science which arise in investigation and practice. By it, it is hoped, the student of human medicine and veterinary medicine may early learn to direct his attention to the most important points of general medicine, and so from the start render the understanding of many questions much easier. But, above all, its purpose is to introduce

the veterinarian and the student of veterinary medicine to the study of comparative pathology and therapeutics, and to give in concise form not only a general survey of the subject, but at the same time sufficient detail for practical purposes with reference to standard authorities and hints as to the field of investigation still unoccupied.

In an admirably clear and concise introduction of nine pages the author gives a history of the study of comparative pathology from Hippocrates to Virchow, with the general results so far obtained. Two pages are devoted to the importance of experimental pathology, with many hints as to the methods of procedure and the opportunities which are offered the veterinarian for investigation at present. The general differences in the symptoms and course of diseases in man and in animals are next pointed out, and then general therapeutics is treated, bringing the subject down to the latest discoveries, such as preventive inoculation, etc. The introduction concludes with a survey of the efforts which are being made at present in various countries for further investigation of the subject. Germany, France, England, and the smaller Continental countries are all considered in dealing with the subject.

Vol. I. (200 pages) treats of the infectious diseases of man and the domestic animals.

Vol. II. (240 pages) treats of poisons; diseases of man and animals caused by parasites; constitutional diseases; skin diseases.

As an example of the method of the author we give a short account of his treatment of glanders, the second disease treated of in Vol. I. Eight pages are devoted to the subject. At the start the scientific name is given; then follow the names applied to the disease in Germany, France, Italy, and England.

Half a page is devoted to the history of the disease; when and by whom it was first noticed; the names of those who have investigated it; how views have changed in regard to it; the latest discoveries, etc. The list of names extends from Aristotle to Virchow, and includes both those who have studied the disease in man and those who have studied it in animals.

Two paragraphs are devoted to the method of spreading and the appearance of the disease; valuable statistics are given and the animals mentioned which enjoy immunity against the disease.

A paragraph is given to the bacterium; its description and conditions of propagation. Another paragraph to its effect upon the animals, the organs affected, and the pathological changes. Lastly, the tests for the bacilli.

Two pages treat of glanders in man under the following heads : Causes, symptoms, and course of the disease ; the anatomical conditions after death ; diagnosis, prognosis, and therapeutics.

Five pages are devoted to glanders in animals. Causes in the horse, anatomical conditions of the organs affected, symptoms and course of the disease ; diagnosis, differential diagnosis in regard to the various phases the disease may take ; prognosis and therapeutics.

A half-page is devoted to an account of veterinary police regulations in the various European countries, the attitude of the sanitary police in regard to meat from affected animals, and finally the laws that have been enacted in regard to it in the various European countries.

A good index accompanies the volumes. The text and paper are all that can be desired. The author has drawn on all the standard authorities for the various diseases.

The work appears to have been prepared with the thoroughness and conscientiousness characteristic of the Germans. It is admirable for conciseness and completeness, and we believe that as a manual it admirably fulfils its aim as a help to both the practitioner and the investigator.

One of the best points is that all the very latest statistics, results, and discoveries are contained in it.

THE ENCYCLOPÆDIC DICTIONARY. Syndicate Publishing Co., Philadelphia, 1897.

A WORK in four volumes, complete in covering the entire English vocabulary, with those of recent acceptance in the newer fields of scientific investigation, made more valuable by many suggestive illustrations and full-page reproductions, in colors and black, of the greatest interest in elucidating the field covered. We have looked for many of the more common terms, some of the obscure ones used in veterinary science, and found in each one a clear, concise definition, in many instances illustrations, to better afford a clearer conception. With this work in their libraries, veterinarians will be well equipped, will find a great time-saver and a help in reading, an assistant in writing, and a support in better expression of inestimable value. The fourth volume contains a series of tables, of popular terms and expressions, colloquial names, and many other pages of abbreviations and matters of interest, value, and importance to the busy everyday practitioner.

COMMENCEMENT EXERCISES.

NEW YORK COLLEGE OF VETERINARY SURGEONS.

THE commencement exercises of this College were held at the College Hall, 154 East Fifty-seventh Street, April 1st. After the conferring of the oath of Hippocrates and a short speech by the President of the College, Herman M. Biggs, M.D., the diplomas were awarded to the following gentlemen: James Burns, Newark, N. J.; Fred. L. Bodwell, Manchester, N. H.; William Eckl, Brooklyn, N. Y.; Albert Hecker, Albany, N. Y.; John S. Jones, Poland, N. Y.; John B. Jones, Marlboro, N. J.; Elmer Judkins, Ohioville, N. Y.; Alfred Heard, New York; Alfred J. Pitcher, Warrensburg, N. Y.; Joseph Saile, Brooklyn, N. Y.; Charles F. Spies, Belmar, N. J.; Edward K. Stretch, Hoboken, N. J.; Thomas E. Smith, Jersey City, N. J.; Frank Sturges, Melrose, Mass.; Harry Q. Thompson, Deering, Maine.

Frank P. Sturges was awarded the gold medal for general proficiency, and William M. P. MacKellar the silver medal for passing the best junior examinations. The practical prize—a set of instruments—was awarded to Harry Q. Thompson and Thomas E. Smith.

Later a dinner was served at the Hotel Marlborough, Fred. L. Bodwell, V.S., as toast-master.

Besides the graduating class, the trustees and the Faculty, there were present representatives from the junior classes and a large number of the alumni. The toasts were drunk with enthusiasm, and the responses were attentively heard.

Dr. Hecker said:

It is with feelings of much hesitation that I undertake to express, on behalf of myself and the other members of the class of '97, the appreciation which we all feel for the endeavors which have been made in our behalf by the Faculty of this institution. Neither by words, nor otherwise, is it possible for us to express the worth of your services to us. The measure by which to express the value of services which render a man proficient in a profession by which he is not only to gain his livelihood, but which is to determine his standing in the community where he is to live, and the respect which he is to command from his neighbors, does not exist. It has been your constant aim to do everything in your power to fit us for the life work which we have deliberately selected for ourselves; to perfect us in a profession which, although as a profession comparatively new, has already taken rank as one of the learned professions, which is now receiving the

most serious consideration from scientific men, and commands the interest and respect of all humane people. We appreciate the efforts you have made in our behalf. We appreciate that in your work you have been actuated by higher motives than are to be found in any pecuniary consideration. We know that you have felt a sincere and genuine interest in our progress here and in our future, and that not the least of your compensations for your work is to be found in the hope which you entertain that we may succeed in becoming a credit to the college and to our instructors. And if we shall succeed, I know of no one to whom that success will bring more sincere and genuine satisfaction and pleasure than it will to those who have fitted us for our work.

Speaking not only for myself, but in behalf of all those whom I represent, I thank you, and I assure you that we shall all endeavor to be a credit to the profession for which you have assisted us in preparing, and a credit to the college. But we remember, and shall all bear in mind, that "an honest endeavor is worth ten promises."

To the gentlemen of the class of '97, with whom I have been so pleasantly associated, I wish to express my thanks for the honor which they have conferred upon me, and I know of no better way in which I can do so than in the most direct one. Our association here at the college has not only been a pleasant one, but it has, in more ways than one, been a most profitable one. We have not only been able to assist each other to pleasantly while away some leisure hours; we have not only been enabled to be of service to each other in the study of our chosen profession; but the mutual regard and respect which we have learned to entertain for each other have, of necessity, increased in every way our respect for ourselves and our profession.

The remembrances connected with our association here will never cease to be an incentive to us in whatever direction we may turn. This day, to which we have all looked forward with pleasure as the day on which we should be finally launched upon our future work with all its happiness and all its anticipation, would not be complete without its regrets—the regrets of parting from warm friends and pleasant associations. But I hope, and I know, that neither stretch of country nor lapse of years will ever rob us of our mutual friendship and esteem or of the pleasant recollections of these months at the college. I know that any success or good fortune that may come to any one of us will be heard as good news by us all, and that the years cannot move slowly enough to make us forget the pleasures of our association or the regrets of our separation.

Toast, "Professional Ethics," responded to by Prof. R. S. Huidekoper, who said:

You have just finished your course of college education which has prepared you for professional life, and you will now find that the real education which will *fit* you for your professional work begins. Your responsibilities while in college ended with your own individual interests and conception of duty. After answering at roll-call at lecture you could listen for an hour, or take a nap, as you liked; after roll-call in the dissecting-room to pacify me you could work for hours, or, a half hour after my back was turned, I might find you occupied with beer and billiards at Krause's, or talking trotting-horse and stable-business with Kaplan. Now, you are

going back to your homes or the location which you have decided upon for your practice, and you will find yourselves looked upon by very critical eyes. You will find that upon your return to a local community that the public will regard you as a sort of prodigal son, and will not only welcome you, but will give you credit for far more knowledge than you really possess. Your old friends will be seeking knowledge from you, and old horsemen and the fire-fender crank will want to teach you the importance of panaceas which at some time of their lives cured some single case, or they will try to guy and lead you into compromising positions.

In your new life you must determine that you must adopt new friends. To insure your future success you have not only to retain the personal and often selfish friendship of your old acquaintances, but you have to build yourself into the esteem of the strangers whom you will meet. In the first place, be careful of the selection of your office. If you have a stable of your own, fit up a neat room in it near the house; have a neat stall or more for temporary use or keeping a horse, and have your gate and yard in good order. If you have to acquire a location, secure the best you can, from a single office room to a stable, which can be transformed into an infirmary, in the most prominent part of the town which your means will allow. Do not associate yourselves with any livery-stable or hotel, or become identified with them. They will want your services for nothing, and your connection with them will insure you the enmity of others.

Call at once upon the other veterinarians in the locality, and make the acquaintance of the physicians of human medicine and any scientists who are near you. After joining the local or State veterinary society of your region, join if you can the local medical society, for from its meetings you can learn much of the general principles of medicine, and as the members learn to appreciate your special application of medicine they will be of direct use to you in spreading your renown. If there are boards of health or of agriculture within your reach, become associated with them, and obtain a position under them if possible. Even if your remuneration for work for them is not great, you will find that the public gives credit to a man with an official position.

Find at once the average of fees of other veterinarians in your locality, and then determine upon your own, and write out a schedule of them in the front of your ledger, and make them invariable. Some time ago I sent out a circular to all the members of the United States Veterinary Medical Association, and I found that the fees for the larger cities were, on an average, \$2.00 a visit for first animal; varying from \$1.00 to \$3.00. In the country from \$1.00 to \$1.50, and \$2.00. In New England and in localities in the country where the graduates came from Harvard and the University of Pennsylvania, the fees were the highest, and where the graduates were principally from some of the old diploma mills, the fees were the lowest. I found a great want of unanimity in the fees for operations requiring the use of contention, hobbles, etc., and those bringing blood, and as regards the furnishing of medicine.

I would suggest that, according as you find the fees of others in your neighborhood, you adopt a scale somewhat as follows, within reasonable distance of your office: Visit—first animal, \$1.00, \$1.50, or \$2.00; for each additional animal, 50 cents to \$1.00. For minor operations requiring the

use of twitch or bringing blood, \$3.00 to \$5.00; for operations requiring nobbles, \$5.00 to \$15.00; examination for soundness and consultations, usually, \$5.00; for distances beyond a reasonable distance—that is, the radius of your town and its immediate suburbs, an additional charge of 50 cents to \$1.00 per mile; for long distances by railroad and for expert services in court or elsewhere requiring an entire day's time, a fee ranging from never less than \$10.00, and better \$20.00, \$25.00, or even \$50.00 in special cases, to which you add cost of railroad fare or other transportation. This fee should be equal or greater than the very best day of your practice.

My reason for making the fee for use of contention and minor operations, to bring blood, greater than an ordinary visit, is that you run the risk of injury, the risk of soiling your clothes, and that you have to display expert skill. For use of hobbles the fee should be large, because with all and the best of care your patient will occasionally break its back, and your reputation—through no fault of your own—will in the majority of cases have its back very severely strained, and remain so for some months. This applies also to the operation of castration.

In regard to furnishing medicines, I consider it by far the better plan and preferable to writing prescriptions. Graduate your powders into packages of two for immediate use and repeat, or a dozen for several days; your lotions into pint or quart bottles, and your liquid remedies into bottles containing from a fixed number of doses to the pint to one pint or one quart drenches—one dose to the bottle—and have a fixed price, which is in addition to your visit. Of course, certain special remedies must be a special price.

Having fixed your schedule, adhere to it. You will naturally often be glad to render gratuitous services to the tinker, the peddler, or old Pat, the ashman. But when one liveryman or a decent farmer is paying you for your services, do not let a meaner neighbor persuade you to lessen your charges or bill one cent, under the plea of continuing to employ you, or because he will otherwise employ another veterinarian. Let him employ the cheaper and probably poorer man; he would probably be the last client to pay your diminished bill and the first one to leave you and hunt for another cheap man when you have finished your case.

Dress well and keep your clothes in good order; look and act like a gentleman, and your clients will the more cheerfully pay your expenses. Keep out of horse-deals, especially when your professional opinion is in any way involved in them. Treat other veterinarians with courtesy, but in a professional case or consultation do not let any courtesy or feeling of personal friendship bias your judgment or influence your expression of your own views of a case. Marry a pretty girl as soon as you can pay her expenses, and I sincerely hope for you a successful future.

Dr. Sturges responded, saying to the graduates:

These, our last hours together are ones to be long remembered with feelings of both pleasure and regret—pleasure, for the reason that we have reached the goal for which we have been striving for the past three years, and now, that we have attained our object, there is an undercurrent of regret which we cannot suppress, as we leave here, perhaps never to meet again, each man to go his own way, however distant, and to strive by dint of hard work to reach the highest pinnacle of success which is so precious to us all, and which we can only attain by hard and conscientious work.

We possibly had the mistaken idea when first entering upon our studies that to become the so-called "horse-doctor" was an every-day occurrence, but we were soon undeceived, for after attending a few of the preliminary lectures we began to realize that there *was* work, and hard work too; we find in it not only a study to be confined to our three years of college life, but a lifelong one, and one in which to be successful must be grafted with sound common sense.

Why should we not this evening be thankful that we have received our degrees and are entitled to practise our profession, which is a *noble* one if we just stop and consider what we are called upon to do; we are not treating the human being that can tell us its troubles, but dumb animals, which are incapable of articulating a single word, and whose troubles can only be evidenced by signs, which at times are very vague indeed. Our lives now are to be devoted to this. Of course, we are looking for replenishment of our pocket-books; this is a business, and should be conducted as such, but don't let our greed for "that article that glitters" blind us to such an extent that we forget a dumb animal can suffer as does the human being.

Some of us undoubtedly feel despondent when we see the numerous bicycles and horseless carriages, thinking, perhaps, that the horse has had his day, and is to become a thing of the past; but it will never be said of the horse race that "*they* have seen better days." Why were horses given us, and why later become domesticated to answer so many useful as well as pleasurable purposes? To become superseded by those inanimate and shapeless objects—bicycles and motor carriages, which have neither life nor responsive feeling? No; they are here for a purpose, and that purpose is not yet accomplished, nor will it ever be. With all due respect to the brains that invented these mechanical articles which are endeavoring to supersede the horse, but which cannot ever gain the ascendancy over him, we must conclude the bicycle subject.

Now, for a moment stop and think of the numerous openings there are for the veterinarian, such as never before; for instance, that of meat- and milk-inspection; how important this little detail is in itself, when we consider the immense amount of damage that could be done by leaving this branch unguarded; then, again, the veterinarian is called upon for the physical examination of the animals used for vaccine purposes, this vaccine to be used to immune man against that dreaded disease, smallpox, and within the last few years the antitoxins have sprung up and are being extensively used, and we all know, from our short time here, how important they are and to what extent the veterinarian is connected with their production.

We are now professional men, and should conduct ourselves as such, and endeavor to do our work in a professional manner. There are enough empirics at large without any more joining the ranks; become members, active ones, if possible, of the leading veterinary societies, and endeavor to suppress or stamp out this evil, which is degrading our profession; surely, there are enough prominent veterinarians to overcome this, and we must do our share in the matter and not leave it all to the older heads, who, perhaps, have fought until they are weary, and to whom renewed vigor from younger ones would act as a stimulus. It surely is discouraging to a student who, after expending time and money for a collegiate education, to find upon graduating that he has long and hard work in store for him to combat with these so-called "quacks."

We should also make ourselves familiar with both national and local topics, and be able to converse with the people; don't let them get the erroneous idea that our entire knowledge is confined to our profession; get in the best society and hold up our heads. Why should we not? Surely, our aim in life is higher than a great many whose company we may be in at the time.

We have this day taken the Hippocratic oath; let us live up to it.

Now on parting, each and every one of us should make up our minds to uphold the good name the older ones have given the veterinary profession; let each man do his best, and don't have it said that the "Class of '97" sank entirely into oblivion.

To the faculty:

We have now to bid you farewell, you who tried so hard to impart some of your knowledge to us, and which you may be sure we appreciate and shall ever retain in our memory.

We were fortunate in having the opportunity of being students to the able corps of teachers whose signatures we will be only too proud to point to on our diplomas.

We have tried hard to grasp the new ideas advanced us by you, and can understand what a task it must have been, day after day, to endeavor to instil a little of your knowledge into our cloudy brains. We have tried our best to retain it until our poor brains were narcotized with the effort, and is it any surprise, even with the best intentions and respect to you, that we would become drowsy in some of the lectures? Indeed, we have fought many a bitter fight in our heroic endeavors not to look sleepy, and have usually succeeded in winning, perhaps, owing to the hour coming to a close, or to some kindergarten idea which we flattered ourselves we could grasp and retain until our examinations, and then with what joy did we impart it again to you, as does the phonograph to a gaping crowd; but, we all seriously thank you for the foundation of our future life and success; it has been firmly laid, and with this foundation there is no reason why we should not do credit to you who so willingly and freely imparted it to us.

Naturally we are impatient to begin our new life; but withal, we feel deep regret in leaving you, for now, when in doubt, we have no father confessor to come to, no one to lean on, we must rely entirely upon what we have obtained in our brief time as your students, and which cannot but help to pull us through.

There are those among you whose names are known not only here, but across the water, and why should we not feel proud at having served our apprenticeship with you? We hope at some future time to meet you and show our appreciation, other than in words, as these few remarks give but an indefinite idea of what we owe you, and of our thanks. Now, dear teachers, you may rest assured that there is one part of our college life we shall always remember and hold in the highest esteem and love, namely, "The Faculty."

McKILLIP VETERINARY COLLEGE.

The commencement exercises of the college were held in Assembly Hall, Tuesday evening, March 30th. After prayer by Rev. Dr.

Staff, Acting Dean Schoenleber addressed the students, followed by a salutatory by Dr. E. Merillat. An address was also made by Dr. E. M. Reading; "Class Prophecy," by S. Hutson Caldwell; "Class Poem," by W. S. Powell; "Class History," by O. R. Dubia. After the valedictory by E. H. Brown the degree of M.D.V. was conferred by President McKillip on the following graduates: Ernest H. Brown, Hawarden, Iowa; John B. Boomer, Chicago, Ill.; John H. Crawford, Racine, Wis.; S. Hutson Caldwell, Chicago, Ill.; Charles N. Ferrier, Jamestown, N. D.; E. Merillat, Toledo, Ohio; W. S. Powell, Sparta, Wis.; O. R. Dubia, Chicago, Ill.; George J. Tyner, Paradise, Ind.; and Harry O. Davis, Chicago, Ill.

The exercises were witnessed by a large number of invited guests.

VETERINARY DEPARTMENT, COLUMBIAN UNIVERSITY.

The commencement exercises of this school were held April 10th, in the lecture hall of the University. On the stage were seated President Whitman and the Faculty of the school, with the ten graduates. After an overture by the orchestra, Rev. John O. Knott offered prayer. Prof. D. E. Salmon addressed the students, discussing the progress in medical science and its application to animals. The valedictory was delivered by Mr. Elbert C. Switzer, after which President Whitman presented diplomas to the following graduates: Reid R. Ashworth, of Rhode Island; William H. Boyln, of Virginia; Basil A. Brown, of England; William P. Ellenberger, of Illinois; Joseph Neilson Megary, of Maryland; Floyd G. Scannel, of New York; John Shaw, of Delaware; Elbert C. Switzer, of Massachusetts; Robert H. Twitty, of North Carolina; George Ransom White, of Tennessee. Dr. Whitman, in his closing remarks to the graduates, stated that the University would follow their careers with interest. They would always find a cordial welcome there.

The following gentlemen obtained a high general average in their examinations and were given honorable mention: Reid R. Ashworth, Elbert C. Switzer, and George R. White.

INDIANA VETERINARY COLLEGE.

The annual commencement exercises were held March 26th at the college building, 18-24 S. East Street. The exercises consisted of addresses by Dr. L. A. Greiner, Secretary of the College, Dr. Thomas Gaddes, Dr. E. H. Pritchard, and Dr. F. A. Mueller,

after which Dr. T. L. Armstrong awarded the diplomas to the following: Clarkson Gause, Carthage, Ind.; David Waugh, Pittsburgh, Pa.; Robert F. Harper, Indianapolis, Ind. After the exercises the graduates of the Indiana Veterinary College met and an Alumni Association was organized. The following officers were elected: Thomas Gaddes, M.D., V.S., President; Joseph Creedon, V.S., Vice-President; L. A. Greiner, V.S., Secretary; F. A. Mueller, Ph.G., V.S., Treasurer. The following were elected trustees to serve one and two years respectively: Dr. Harry Smock, Franklin, Ind.; Dr. Wilbur Ramsey, Middletown, Ind.; Dr. J. B. Heaton, Bloomfield, Ind.; Dr. S. Rodebaugh, New Augusta, Ind.; Dr. Clark Gause, Carthage, Ind. The meeting then adjourned, and a general good time was had the balance of the afternoon.

ONTARIO VETERINARY COLLEGE.

The exercises at the closing of the session of 1896-'97 took place on March 26th. The Principal, Prof. A. Smith, F.R.C.V.S., in the chair; beside him on the platform were the members of the Faculty and a board of examiners, most of whom are prominent veterinary surgeons who are practising their profession in Canada and the United States.

Prof. Smith opened the meeting with a short but eloquent address. He congratulated the successful students on passing the searching ordeal of a final examination. They were now about to engage in the "battle of life" by putting the knowledge they had been acquiring by study into actual practice, and he most heartily wished them every success in their chosen profession.

Mayor Lloyd gave the recent graduates some excellent advice, founded on many years' experience, as to their conduct and deportment with the public at large, urging the necessity for aiming at a high standard; of honorable dealing with the public at large, as well as to still keep pressing onward in the race for knowledge, as only by those means could future success be assured.

Prof. J. H. Reed, of the Guelph Agricultural College, also gave a short address; among other matters, he particularly mentioned that a proper standard of professional ethics and etiquette should be strictly observed in our dealings with brother practitioners; that we should each and all strongly disapprove of deprecatory remarks directed against our neighboring brethren, and by no means to class them as opponents, but as all pressing forward for the same goal

—the advancement of our own knowledge and the advancement of the profession at large.

The addresses were all warmly applauded by the students and graduates.

The degree of V.S. was then conferred on the following gentlemen :

E. L. Bertram, Strausstown, Pa.; George C. Bowen, Newark, N. J.; Wallace P. B. Brennan, Parkhurst, Quebec; Frank W. Bryant, Sunderland, Ontario; Clinton H. Bugbee, Keene, N. H.; Henry Buss, Deansville, N. Y.

Wallace Caister, Tavistock, Ontario; George R. Caldwell, Ashton, R. I.; John B. Campbell Grandin, N. Dak.; Herbert B. Chaney, Akron, Ohio; Robert C. Cliff, Hamilton, Ontario; T. J. Cooper, Lockport, N. Y.; W. R. Cross, Beeton, Ont.; Clarence W. Clark, New Britain, Conn.

Wilson S. Decker, Scranton, Pa.; John Dodd, Glasgow, Scotland; James A. Durkin, London, Ont.

Thomas A. Ewart, Wyoming, Ont.; W. H. Erwin, Mason, Mich.

Robert J. Farley, Toronto, Ont.; Andrew L. Fosse, Deerfield, Wis.

George J. Grange, Guelph, Ont.

George Hilton, Winnipeg, Manitoba; Fred. R. Hodgson, Forest, Ont.; Fred. A. Hoskin, Forest, Ont.; Charles S. Horne, Walnut Grove, Miss.

John N. Johnston, Petersburg, Ont.

Fred. Kemmer, Connersville, Ind.; Newton A. Kippen, Tiverton, Ont.

John J. Linden, Canandaigua, N. Y.

W. Frederick McElroy, Bewdley, Ont.; William O. McHugh, Bridgeport, Ohio; G. A. McKenzie, Deloraine, Manitoba; D. J. McKillop, Bristol, Quebec; John A. McKinnon, Sonya, Ont.; Alfred A. McLachlan, St. Johns, Newfoundland; W. McCorkindale, Toronto, Ont.; C. S. Macdonald, Toronto; Ont.; Rudolph J. Marshall, Hoosick Falls, N. Y.; Wilfred J. Meloche, Ogdensburg, N. Y.; Walter D. Monk, South March, Ont.

Alfred J. Nelson, Stoughton, Wis.; Isaac S. Norton, Marshall, Minn.

Robert D. Orr, Baden, Ont.; Thomas M. Owen, Gaithersburg, Maryland.

Jesse H. Pierce, Smithfield, Pa.; Charles A. Prouty, Putney, Vermont; George S. Price, Fenwick, Ont.; Howard F. Pegan, Cochran, Pa.

W. W. Richards, San Diego, Cal.; J. R. F. Rochester, Denton, Maryland; G. Vernon Rowcroft, Birtle, Manitoba.

Andrew Seim, Ayton, Ont.; D. K. Smith, Toronto, Ont.; Lyndon S. Smith, Cornish, N. H.; George P. Statter, Sioux City, Iowa; Jasper J. Smart, Sherborn, Mass.

Charles E. Taylor, Sawyerville, Quebec; A. E. Tweedie, Ivanhoe, Ont.

J. Eugene Underhill, Middletown, Conn.

Charles E. Virtue, Mt. Gilead, Ohio.

William H. Wheeler, Stamford, N. Y.; John W. Will, Petrolia, Ont.; J. A. H. Winsloe, Buffalo, N. D.

The prize winners were as follows :

Disease and Treatment. Seniors: First prize, silver medal, G. Hilton; second prize, H. B. Chaney; third prize, E. L. Bertram, R. C. Cliff, and W. W. Richards. Honors: F. W. Bryant, G. R. Caldwell, W. J. Meloche, A. A. McLachlan, T. M. Owen, J. R. F. Rochester, G. V. Rowcroft, A. Seim, L. S. Smith, W. H. Wheeler, and J. A. H. Winsloe.

Materia Medica. Seniors: First prize, George Hilton; second prize, Robert C. Cliff; third prize, Wilfred J. Meloche. Honors: Frank W. Bryant, Clinton H. Bugbee, Herbert B. Chaney, Wallace Caister, George B. Caldwell, and W. W. Richards.

Chemistry. Seniors: First prize, R. C. Cliff; second prize, G. Hilton and R. J. Farley; third prize, H. Buss. Honors: C. H. Bugbee, G. C. Bowen, G. R. Caldwell, A. Ewatts, N. Kippen, W. D. Monk, W. J. Meloche, W. O. McHugh, J. R. Rochester, G. V. Rowcroft, A. E. Tweedie, and W. H. Wheeler.

Morbid Anatomy. Seniors: First prize, G. Hilton; second prize, T. J. Cooper. Honors: E. L. Bertram, H. Buss, C. H. Bugbee, G. R. Caldwell, R. C. Cliff, H. Chaney, H. Kippen, G. V. Rowcroft, and W. H. Wheeler.

Anatomy. Seniors: First prize, silver medal, R. C. Cliff; second prize, G. Hilton; third prize, W. O. McHugh. Honors: E. L. Bertram, G. C. Bowen, F. W. Bryant, C. H. Bugbee, H. Buss, W. Caister, G. R. Caldwell, H. Chaney, W. Cross, T. J. Cooper, W. S. Decker, J. Dodd, R. J. Farley, F. Hodgson, F. A. Hoskin, J. N. Johnson, N. Kippen, W. F. McElroy, G. A. McKenzie, W. J. Meloche, R. D. Orr, T. M. Owen, G. V. Rowcroft, L. S. Smith, G. P. Statter, C. E. Virtue, W. H. Wheeler, and J. A. H. Winsloe.

Entozoa. Seniors: First prize, C. H. Bugbee. Honors: E. L. Bertram, H. Buss, G. R. Caldwell, T. J. Cooper, R. J. Farley, G. Hilton, A. J. McKillop, W. J. Meloche, W. O. McHugh, J. R. T. Rochester, W. W. Richards, and W. H. Wheeler.

Dissected Specimens. Seniors: Gold medal, given by the Toronto Industrial Exhibition Association, C. S. Macdonald.

Physiology. Seniors: First prize, George Hilton; second prize, W. O. McHugh; third prize, E. L. Bertram. Honors: H. Buss, C. H. Bugbee, Frank W. Bryant, Robert C. Cliff, T. J. Cooper, and W. W. Richards.

Best General Examination. Gold medal, given by the Ontario Veterinary Association, R. C. Cliff. Honors: H. Chaney, G. Hilton, and W. J. Meloche.

PRIMARY EXAMINATION.—*Anatomy.* Seniors: J. O. Henry, L. Paquette, R. P. Scandrett, Winfield Wallace.

Materia Medica. H. Paine.

Disease and Treatment. Juniors: First prize, C. W. Fisher; second prize, J. S. Pollard; third prize, E. R. Stockwell and W. H. Shaw. Honors: W. L. Adams, L. Bailey, S. Caldbick, W. R. Clark, W. H. Corey, R. B. Coutts, W. G. Huyett, C. H. Jewell, A. Jordan, T. Lambrechts, E. H. Hawley, D. McKenzie, R. Macdonald, J. W. Rutledge, A. Sorensen, H. W. Stedman, T. Sims, Samuel Shepard Treadwell, A. G. Vantine, and A. C. Walker.

Anatomy. Juniors: Silver medal, C. W. Fisher; second prize, T. Lambrechts; third prize, J. S. Pollard. Honors: John Black, W. D. Brand, L. Bailey, S. Caldbick, R. B. Coutts, L. T. Dunn, G. W. Higginson, W. Huyett, C. I. Irons, C. H. Jewell, G. H. Lawley, J. A. McDonald, A. D. McLachlan, R. McDonald, D. McKenzie, J. W. Rutledge, John Short, W. H. Shaw, E. R. Stockwell, T. Sims, C. Stevenson, H. W. Steadman, S. S. Treadwell, A. Walker, and S. J. Waterman.

Physiology. Juniors: First prize, C. W. Fisher; second prize, C. H. Jewell; third prize, T. Rowland. Honors: L. Bailey, E. H. Lawley, T. Lambrechts, D. McKenzie, J. S. Pollard, and T. Sims.

Chemistry. Juniors: First prize, C. W. Fisher; second prize, T. Rowland. Honors: W. D. Brand, L. Bailey, G. R. Cranston, E. C. Elwes, G. F. Irons, A. Jordan, E. H. Lawley, T. Lambrechts, Milton McClellan, D. McKenzie, H. Moore, J. S. Pollard, J. A. Raleigh, T. Sims, E. R. Stockwell, and S. J. Waterman.

Histology and Microscopy. Juniors: First prize, C. W. Fisher; second prize, G. F. Irons; third prize, S. S. Treadwell. Honors: L. Bailey, W. D. Brand, A. Jordan, E. H. Lawley, T. Lambrechts, R. Macdonald, D. McKenzie, and T. Rowland.

In closing, Mr. C. S. Macdonald, President of the graduating class, presented Prof. Smith with a magnificent picture of the class, to which the Principal responded.

In the evening a banquet was given by the Ontario Veterinary Association, presided over by Prof. Smith.

UNITED STATES COLLEGE OF VETERINARY SURGEONS.

The annual examinations of this institution, which have been in progress since April 1st, closed on the 15th. The Faculty presented the following gentlemen for graduation, they having completed the course and passed successfully the prescribed examinations in all branches of veterinary science: Webster Clay Langdon, of Fargo, N. D.; William B. Elliott, V.S., of Riverside, Cal.; William E. Yetton, of Washington, D. C.

The Hon. J. H. Brigham, Assistant Secretary of Agriculture and Master of the National Grange of the United States, was introduced to the Faculty and students by the Dean, Prof. C. Barnwell Robinson, after having opened the ceremonies of commencement with a brief but interesting outline of the history and progress of the College.

Secretary Brigham presented the diplomas to the graduates with a few very appropriate words in which he pointed out the close relation between the veterinarian and the agriculturist, and emphasized the necessity of profiting by their education to make their experience of use to them, of a high standard of rectitude in their relations with their clients, and of humanity toward their patients, thus being true to themselves and to their alma mater.

Prof. D. S. Lamb, A.M., M.D., then delivered on behalf of the Faculty the following address:

At the request of our worthy Dean, I will say a few parting words in this, the closing hour of the third session of the college and the corresponding commencement.

Since a year ago, during which teachers and pupils have been devoting themselves to the routine of lectures and recitations, clinics and laboratory

work, the world of medicine, both in its human and comparative side, has been making progress. This progress has been most marked in the domains of pathology, diagnosis, and treatment. Pathology has been notably enriched through the work of the experimental laboratory, and especially by the investigations in bacteriology. The study of the pathogenic organisms; their multiplication, especially in the form of spores; the methods, especially the methods of staining, by which they may individually be recognized; their different forms at different periods and under different circumstances, especially their involution-forms; their strong resemblances and marked differences, and their cultures, by which also they may be identified; their habits and habitats; their relative and actual virulence; the various ways by which they cause death; how they may be destroyed, from the air, from the water, from the soil, from our clothing, houses, and food; from the animal itself; how they may be attenuated or intensified; the relative and actual susceptibility of individuals to their influence and the influence of their toxic products; how long they can preserve their pathogenic powers, and under what circumstances; what is the best and most efficient prophylaxis against them, and what the best and most efficient treatment of the diseases which they cause.

These and other questions which I have not mentioned, are questions which arise and are to be answered in connection with each pathogenic organism. The number and variety of these questions will give sure ideas of the vastness of the subject and the immensity of the work which the bacteriological laboratory is called upon to do. The year's work has been large and various. Just how much of the result promises to be useful in the prevention and treatment of disease remains to be seen. Of course, in our impatient way, we are prone to forget that the progress of the world is in the main by slow and laborious steps. It is only at intervals that we are dazzled by some great and brilliant discovery, as by the comet in the depths of the space around us. So also in our lives, when we sum up the year's work in a pecuniary way, after deducting our expenditures from our receipts, our actual savings may be very small indeed. So also in science, the sum total of progress in the year may seem very small. But the work has been done, it has been good work and useful, and at the end of the year there is a gain, though it may seem disproportionately small.

Perhaps the most interesting and important part of this subject of bacteriological work is that of serums, their prophylactic and curative powers. The subject is broad and deep, the results thus far obtained are at the least very encouraging. We have learned one great truth beyond any question, and that is that a healthy blood-serum is very decidedly germicidal, so much so that the bacteriologist often fails to grow his organism upon it. Thus with the addition of leucocytes, we are, so to speak, twice armed against the germs that may be introduced within our systems. By means of certain methods and processes we are able to procure serums which when introduced into the animal economy are found to prevent or to act as an antidote to certain diseases. Especially among the lower animals has this new truth a great commercial value, apart from what I may call its humanity. How these animals may be inoculated; how they may be immunized; how their early infection with disease may be diagnosticated; how they may be cured by means of attenuated toxins and antitoxins. These are

some of the questions and problems which confront us and which are being answered one by one for now this disease and then that.

I am aware that this subject of microöganisms is perhaps becoming tiresome, especially to those who are yet skeptical in regard to it, but it seems to me that the revelations of the microscope and of the staining-methods and cultures and experiments of the bacteriological laboratory are not fairly appreciated even by the most enthusiastic students. The light is as yet too dim to see much of this, as well as of other vast vistas in science. I believe that we as yet but remotely conceive the far-reaching expansion of our vision in the next decade.

I pass by the other items of the pathological advances of the year, and will touch for a moment upon the work of the clinical laboratory. This indeed has revolutionized and is revolutionizing the subject of diagnosis, especially in human medicine. This subject, too, is too vast to dwell upon long. The study of the blood-cells, the leucocytes, the red cells, the plaques, etc., is helping us to a new and unexpected means of diagnosis, which in its way promises as much variety as the other subjects of bacteriology—the number of cells and of each kind of cell in the cubic millimetre of blood at various times, as after a night's rest, after a meal, after meals of certain definitely known constituents, under circumstances of active exercise, of sleep, of sedentary work, in the thousand and one diseases to which man and the lower animals are liable. Not only the number of these cells, varying on occasion, but their size, and shape, mononucleated, multinucleated; their response to various staining-reagents—here is an almost infinite variety. We are only on the threshold of the great building which our children and our children's children are destined to see. There is now added to our means of diagnosis an increasingly powerful and certain help, the value of which is too dimly conceived. I could dwell upon this topic a long time, but dare not.

The diagnosis of diseases of the stomach, in the human subject especially, is now greatly aided by this same clinical laboratory, by the giving of test-meals and their subsequent examination, to determine the digestive power of the stomach; the examination of the stomach-contents in important cases, in medico-legal as well as individually, simply diagnostic. Thus, in regard to the diagnosis of diseases of the kidney, we have the conjoined examination of the urine and the blood. A little blood from the end of the finger may settle the question of malaria, or typhoid fever, or some other disease. A little blood and a little urine may determine whether we have a malignant disease of the urinary passages; permits us to estimate the probabilities of a generalization of the malignant growth.

Again, in the clinical laboratory in conjunction with the physiological, we may determine the action of medicine and diseases under the most favorable circumstances, so far as the lower animals are concerned, and by analogy we may reason out more or less accurate conclusions for the human subject; the results are promising. Taken altogether, the laboratory work of to-day is carrying the modern physician to a place in practical diagnosis and therapeutics beyond the brightest dreams of the fathers in medicine. To this may be added the progress in sanitation, the municipal, State, and personal means by which we may protect our homes; schools and other buildings may be improved in matters of light, of heat, of ventilation; our water-supply purified; our food-supply preserved unadulterated, and our

medicines as well; and the thousand other ways by which our municipal and individual health may be preserved, our life lengthened.

One by one an enemy falls, and the time should come, and probably will, when the last one shall perish by the wayside.

New industries, new inventions, introduce new dangers which physician and sanitarian must prepare to meet. We have each an individual duty to perform, the proper diffusion of scientific knowledge is helping toward the good time coming, because as the laity are educated they co-operate with the physician and sanitarian.

Evidently there is a very definite progress each year in the light of municipal and personal rules of health. Our homes are so much better lighted, heated, ventilated, than those of our fathers; our dietaries improved, our clothing more healthful, provided that fashion will permit.

We bathe a dozen times where our fathers bathed once. We have improved at the same time the housing and surrounding of our domestic animals. Cleanliness, which is so close to godliness, is a thousand times better observed in our case than in older times. A word to the gentlemen who graduate.

I can enter somewhat into your feelings of the moment, as you think of the transition you are making from the state of pupilage to that of the practitioner. You have a future, and you hope it may be a bright and happy one; and I hope so, too. But my own experience and observation have shown me that there are two things you ought to make up your minds to do. One is to lead a straightforward, honest, and manly life, despising mean and little things, and trying to do the best you can—good practitioners and good citizens, trying to improve your time and opportunity, commanding the respect and confidence of your fellows. The other is to remember, as the lamented Garfield was wont to say, “It is the unexpected that happens,” or as Cardinal Wolsey said:

. . . comes a frost, a killing frost,
And when he thinks, good easy man, full surely
His greatness is a-ripening, nips his root,
And then he falls.

Or that other quotation, the author of which I cannot at this moment recall, and whom you will probably recognize as familiar to you:

“From care and trouble rest your thought,
Even when the end’s attained,
For all your plans may come to naught
When every nerve is strained.”

These things are not said to discourage you. Life’s successes are attained by honesty, by diligence, good judgment, industry accompanied by a certain indispensable amount of knowledge of your profession, some more, some less. If you preserve your health, and I hope you will, keep yourselves free from bad habits and observe the other things I have mentioned—you will succeed, and you will deserve to succeed.

I express the sentiment of the entire Faculty, whom I to some extent represent, in commending you to the kindness and moral support of your fellow practitioners, while you attend diligently to the duties of your vocation.

The Valedictorian of the class, Mr. Langdon, then addressed the Faculty and the students thus :

HONORABLE THE DEAN, MEMBERS OF THE FACULTY, AND FELLOW-STUDENTS.

GENTLEMEN: I thank you for the privilege and honor extended to me in giving me the opportunity to act as spokesman in delivering the farewell address to the Faculty for the class of '97.

I regret that the exigencies of the case have prevented me from preparing a more elaborate address for the occasion for extemporaneous delivery, but the preparation for the final examinations in a college whose curriculum has undoubtedly the widest range of any similar school in this country, embracing as it does fifteen subjects upon which the student must pass before receiving his degree, leaves, I assure you, but little time, and very much less energy in the individual of ordinary abilities, to commit an address to memory.

It has seemed to me that when a few sincere words of justified appreciation, where such appreciation is due, and the assurance of mutual good-fellowship, and a desire for continued advancement along the lines marked out for us by an honored and faithful Faculty, are all that could be required of me at this time.

We are as students particularly favored by the cosmopolitan character of this city, the home of our alma mater. This characteristic is well reflected in the composition of our classes, which literally include men from New Hampshire to California. Such a condition is perfectly natural, growing as it does out of the numerous and varied educational advantages afforded by the museums and other public institutions, as well as by the residence in the city of those thoroughly skilled in the various branches of learning and science here represented. Boston for years was considered the hotbed of education, in fact was conceded to hold the palm as the principal seat of learning in America. New York has been her rival for years, but Washington, with the characteristic precocity of all things American, seems to have wrested this honor from all competitors at one grasp. It is, then, our duty, and will be our pleasure in so far as this institution forms a part of a great and unique whole, to maintain this eminence, and add if possible new laurels to her fame.

And what, indeed, will be our excuse if we fail utterly in this, our obvious duty? The indomitable will, energy, discernment, and faith of our Dean have secured for us, if you will pardon the directness and flatness of the assertion, the flower of the profession in each particular branch included in our course—the elder men of worldwide reputation, and the younger proportionately known and appreciated, and as all our class believes, particularly gifted with the talent most useful to the world, and consequently most desirable—the ability to impart knowledge.

The institution, though young in years, is, aside from the great advantage of a competent corps of professors, equipped with the necessary appliances for practising the precepts poured out to us by our instructors, and thus if we do not leave our alma mater well supplied for our journey, it is not through any lack of depth in the well or any lack of size or force in the stream, but, on the other hand, through the shallowness of the receptacle into which it flows, and if the same honor is not in the time to come

attached to the degree of this, as to that of any other school in the land, we have no one to blame but ourselves. *Ad astra per aspera*, literally "to the stars through asperity," or in the very free translation, or rather paraphrase, of Emerson, "Hitch your wagon to a star."

Honored preceptors and instructors, we bid you farewell, begging you to accept our hand of friendship and appreciation, with the assurance that your labors in our behalf shall not be in vain and shall not go unrewarded, and that it will be our aim to do our part in the upbuilding of the institution, to the end that not the least of your causes for self-congratulation shall be that you are professors thereof.

Fellow-students, we have passed these months together in mutual efforts toward the acquisition of knowledge and with mutual pleasure and good feeling. But we must not forget that our responsibilities only begin here. We are given the material for the foundation of an honorable position in our chosen calling, and in which there are ample opportunities of raising the standard of excellence, and of raising our standing in the world at large. There is no reason why we should not be on a level with all other learned professions, for to have success here are required as much learning, as much skill, and infinitely more observation and intuition than in human medicine, together with a knowledge of comparative medicine and surgery not absolutely necessary to the latter.

What are our means so far equipped of attaining this end? Few and simple indeed and plainly within our grasp—strict honor, absolute truth, "though not necessary to tell all we know about a thing at all times," conscientious work, which means the establishment of perfect confidence between practitioner and client.

Our course of prescribed study finished, we will not weakly and abjectly sink into a life of pure routine which precludes all advancement, but struggle not only to hold our footing, but try to make further progress; for, says an eminent philosopher of our times, "He who is silent is forgotten; he who abstains is taken at his word. He who does not advance falls back. He who stops is overwhelmed, distanced, crushed. He who ceases to grow greater, becomes smaller. He who leaves off, gives up. The stationary condition is the beginning of the end, is the dreadful symptom that precedes death." Therefore, let us on the eve of this new era in our lives, while looking into the future, full of dangers and difficulties, but with the shining goal in view, bear in our hearts the admonition so appropriately selected as the motto of our alma mater, "*Vestigia Nulla Retrorsum.*"

Prof. George A. Prevost then, on behalf of the trustees, made a few exceedingly felicitous remarks which were received with applause.

The second-year examinations were passed by Messrs. M. S. Lantz, Samuel Gelson, George N. Brady, Benjamin Gheen.

Mr. Arthur Currier took the prize for the best general examination in the first-year class.

The degree of Fellowship (F.U.S.C.V.S.) was conferred upon D. S. Lamb, A.M., M.D., of Washington, D. C., and C. H. Ford, D.V.S., of New Orleans, La.

The conditions under which this degree is granted may be more fully understood by reference to the catalogue and prospectus of the College.

In this instance it was conferred owing to scientific contributions from the candidates.

CHICAGO VETERINARY COLLEGE.

ON Wednesday, March 24th, the students and the graduating class of 1896-'97 were given a banquet by the faculty at the Sherman House. Justice having been done to the good things set before the participants, speeches and toasts emphasizing the good feeling existing between the faculty and class were indulged in, and at a late hour the banquet hall was vacated, a most delightful evening having been spent. On Thursday, March 25th, the commencement exercises were held in the college auditorium, the large hall being specially decorated for the occasion. The audience, consisting of the friends of the faculty and graduating class, thronged the lecture-room, filling it to its utmost capacity. The class colors—purple and white—were conspicuously worn by the majority of those present. The proceedings opened by instrumental music by the Lawndale quartette. On the platform were grouped all the members of the faculty, the chair being occupied by Dr. Joseph Hughes, who, in his opening remarks, briefly related the history of the school, and highly complimented the graduating class on the splendid showing made by them, of the twenty-two graduates thirteen having passed with honors, of which the following is a list according to their standing: Drs. M. J. Dunleavy, J. H. Oliphant, G. P. Frost, F. W. Benteen, Jr., F. L. Cusack, E. T. Frank, George Fry, James Smellie, C. A. Bradley, V. A. Holden, H. J. Schneider, W. F. Fish, and T. J. Menestrina.

Special congratulations were tendered to Dr. M. J. Dunleavy, who obtained the gold medal for the highest general average; to Dr. J. H. Oliphant, who obtained first prizes in the theory and practice of chemistry; and to Dr. George P. Frost, who obtained the prize in anatomy. Having made this announcement, the chairman conferred the degree, M.D.C. (Doctor of Comparative Medicine), and delivered diplomas to the following members of the graduating class: J. H. Oliphant, Macon, Ga.; William Sonerol, Ludington, Mich.; A. M. Taylor, Chicago, Ill.; L. D. Brown, Hamilton, Mo.; F. L. Cusack, Milwaukee, Wis.; E. T. Frank, Warren, Minn.; T. J. Menestrina, St. Louis, Mo.; C. F. Gruner, Chicago, Ill.; James O'Donnell, Milwaukee, Wis.; C. A. Bradley,

Wyoming, Ia.; W. H. Scruby, St. Cloud, Minn.; James Smellie, Chicago, Ill.; F. W. Benteen, Jr., Atlanta, Ga.; F. A. Ramsey, Encinitas, Cal.; M. J. Dunleavy, Denver, Col.; H. J. Schneider, Milwaukee, Wis.; W. J. Martin, Kankakee, Ill.; L. W. Young, Chicago, Ill.; G. P. Frost, Dublin, Ireland; George Fry, Naperville, Ill.; W. F. Fish, Chicago, Ill.; V. A. Holden, Sparta, Wis.

When the members of the class had resumed their seats, Dr. E. T. Frank gave a reading, "The Horse's Troublous Life," which was well received. Dr. M. H. Trumbower, in well-chosen and humorous remarks, then distributed the prizes, many beautiful floral tributes being sent by friends of the young veterinarians. A vocal duet and piano solo were then followed by the class prophecy, the prophet being Dr. M. J. Dunleavy, who, in an exceedingly clever and witty production, held up the little peculiarities of his various fellow-students and produced much merriment by his predictions. The valedictory address was a master effort, and was delivered by Dr. L. W. Young, who, during its delivery, on many occasions received the plaudits of the audience. Dr. A. S. Alexander, being absent owing to illness, Dr. J. F. Ryan delivered the doctorate address, and was followed by Dr. A. H. Baker, who gave some healthy advice to the young graduates.

AMERICAN VETERINARY COLLEGE.

THE annual meeting of the Alumni Association of the American Veterinary College was held in the College Hall at 3 P.M., March 25, 1897. Among those present were: Drs. W. H. Lowe, H. D. Hanson, F. R. Hanson, W. B. E. Miller, W. H. Pendry, L. H. Howard, W. Horace Hoskins, Herbert Neher, Otto Faust, C. L. Adams, H. W. Bieser, A. H. Blake, W. J. Coates, E. F. Hogan, E. H. Ackerman, M. W. Drake, M. J. Murphy, R. W. Ellis, L. D. Ives, E. N. Leavy, E. L. Volgenau, F. R. Ogden, Hermann Koch, W. C. Brotherton, and Prof. Olof Schwarzkopf, of Chicago, Ill.

After the reading and adoption of the minutes of the meeting of 1896 the Executive Committee made their report, showing provision for the annual dinner and alumni prize and the consideration of the necessary alterations of the constitution and by-laws, among others a recommendation to establish a list of those members of the Association not in good standing who declined to pay the annual fee of \$1. The election of officers resulted in the selection of Dr. L. H. Howard, President; H. D. Hanson, First Vice-President;

R. W. Ellis, Second Vice-President ; Otto Faust, Secretary ; F. R. Hanson, Treasurer ; Herman Bieser, Librarian. The deaths reported were of Drs. Autenreith, Peralta, Leich, and Southwick, and committees were appointed by the Chair to draw up suitable resolutions in recognition of their death and the loss to the Association.

President Howard's address was carefully prepared and added much to the history of the A. V. C. boys as supporters and earnest workers in the upholding and advancement of the veterinary profession. He referred to the many positions held by them of an official character, and of the thoroughness with which much of the work of the profession was done by members of our Alumni Association. The meeting adjourned at a late hour with a cordial invitation to all the members of the Association to attend the commencement exercises, which were held in Chickering Hall at 8 P.M.

The following programme covered the exercises :

Overture, "Gallathea," (Suppe.) Selection, "Geisha," (Jones.) March, "Valerose," (Wittig.) Prayer, Rev. Adolphus T. Sieker. Intermezzo, "Naila," (Delibes.) Conferring of Degrees, Faneuil D. Weisse, M.D., President Board of Trustees. Selection, "Lady Slavey," (Kerker.) Awarding of Prizes, Prof. L. H. Friedburg, Ph.D. Waltz, "Life's Lullaby," (Bucalossi.) Valedictory, George Bass Blackman, D.V.S., of the graduating class. Selection, "Popular Airs," (Beyer.) Address, Rev. Lindsey Parker, D.D. Benediction, Rev. Adolphus T. Sieker. March, "El Capitan," (Sousa.)

The following students received the Degree of Doctor of Veterinary Surgery : George Bass Blackman, Harry Wentworth Bellman, Jr., George De Witt Boice, Horace Winfield Boyd, Arthur Launy Grover, Bernard Gunther, Howard Suydam Holdenby, James Grant Hope, M.D.C., Ralph Collyer Jenks, John Victor Laddey, Otto Rudolph Leis, James Edward Masterson, John Phillip Messer, John Joseph Murray, Thomas John Ogle, John Gregory Slee, Harry Balthasar Shugar, Thomas Francis Smith, George Stephens, Franklin Smith, C. Chauncey Tietjens, John Thomas, George Frederick Westcott.

Rev. Lindsay Parker delivered the address, and it was one of the most appropriate, interesting, and humorous extemporaneous addresses ever given to a fully appreciative audience. It was interspersed with wholesome advice, and many brilliant thoughts flashed rapidly from the speaker, which fell upon willing ears and minds to grasp and utilize the same.

The valedictory by George Bass Blackman was a thoughtfully

prepared one, giving an adequate idea of the work of the veterinarian; and his remarks to the faculty were happily made, with a thorough appreciation of the sincere efforts of their labors and in their behalf. His parting words to his fellow-graduates, while fully appreciating and willingly accepting the responsibilities that must fall to their lot, were hopeful in that the outgoing class might shed as much honor and lustre over their alma mater as those which had preceded them. The music was of a varied character, very enjoyable, and added much to the pleasure of the occasion.

At the close of the exercises the Faculty, trustees, and graduates repaired to the Hotel Marlborough, where was arranged a series of decorated tables, around which groups of those attending spread themselves, and enjoyed, until an early hour of the morning, the wealth of good things provided to satisfy the inner man, and listened to many suggestive and pointed remarks from members of the trustees, faculty, and graduates, drawn forth by the persuasive powers of the toastmaster, Dr. William H. Lowe. Among those who responded to the toasts were Dr. F. D. Weisse, of the Board of Trustees; Professors Robertson, Coates, and Hanson, of the Faculty; many of the older graduates and member of the graduating class, including the class historian, thus fittingly closing the twenty-second annual reunion of the Alumni Association.

SELECTIONS.

THE SERUM DIAGNOSIS OF HOG-CHOLERA.¹

BY CHARLES F. DAWSON, M.D., D.V.S.,
BUREAU OF ANIMAL INDUSTRY, WASHINGTON, D. C.

IN July, 1896, Widal² described a method which he had recently discovered for diagnosing with ease and certainty the existence of typhoid fever.

The importance of such a discovery is apparent, since by this means physicians can ascertain the existence of this disease with comparative ease. The method is as follows:

A bouillon culture of the typhoid bacillus is examined microscopically to determine the motility and isolation of the individual bacteria. A few drops of the culture are placed in a watch-glass

¹ Reprinted from the New York Medical Journal of February 20, 1897.

² La Presse Médicale, July 29, 1896.

and with this is mixed a drop of blood drawn from the finger-tip of the patient. Hanging-drop preparations are then made from the mixture of culture and blood. A most interesting series of phenomena presents itself. The bacilli are not isolated and moving as they do in ordinary cultures, but lose their motility and become agglutinated and joined together in masses which are separated by wide spaces. The clear spaces are dotted with less motile bacilli, and these can be seen approaching the masses and finally adhering to them. Widal observed these phenomena in preparations made from patients in different stages of the disease. They did not appear in preparations made from the blood of persons in health, and he argues therefrom the reliability of the test. Nor did the phenomena appear in preparations made from patients suffering with other diseases—such as nephritis, tuberculosis, pneumonia, icterus, and rheumatism; but the bacilli remained motile, and exhibited no tendency to become non-motile and massed together in clumps.

These very interesting results determined the writer to apply the test in hog-cholera, a disease resembling typhoid fever in many respects. In these observations, which are preliminary to a more extended investigation of the subject, hog-cholera was induced in a rabbit by the subcutaneous injection of a bouillon culture.

On the fifth day after inoculation a small piece of the ear of the rabbit was excised and clean cover-glasses were smeared with the small amount of blood which oozed from the wound. No attempt was made to prevent the drying of the preparations, and the result obtained would indicate that evaporation of the liquid portion of the blood does not prevent the appearance of the characteristic phenomena. When the preparations were perfectly dry a drop of bouillon culture of the hog-cholera bacillus was placed upon the stratum of dried blood on the cover-glass, which was then inverted over a hollow-ground slide and examined carefully with a Zeiss two-millimetre apochromatic immersion lens combined with a No. 4 ocular. By the time the slide was prepared and focussed the bacilli, which had been previously observed to be motile in a control preparation, became motionless and agglutinated in clumps, exactly as was described by Widal in reference to the typhoid bacilli. A control experiment was made with the blood from a normal rabbit, with the result that the hog-cholera bacilli did not exhibit the slightest tendency to be affected in any way. Similar experiments were made to determine the effect of hog-cholera blood-serum upon the typhoid fever bacillus and the *Bacillus coli com-*

munis. The results were negative. The absence of any effect of the hog-cholera serum upon the typhoid bacillus and also upon the *Bacillus coli communis* is of interest on account of the resemblance of these three organisms in other ways.

Owing to the obscurity of the symptoms usually presented in hog-cholera, it would seem that a method which would render a correct diagnosis would be of considerable value, it being by no means an easy task to diagnosticate hog-cholera from the physical symptoms alone. As it is possible that a cure or preventive of hog-cholera based upon antitoxic-serum therapy will be discovered, it would be of great advantage to have a method for detecting the existence of the disease in its incipency.

While the experiments upon rabbits are not offered as positive evidence that the same results could be obtained from affected hogs, it is reasonable to assume that a similar result is within the range of probability.

PERSONAL.

Drs. John W. Adams, of Philadelphia; H. P. Eves, of Wilmington, Del.; and W. Horace Hoskins, of Philadelphia, will act as veterinary inspectors at the coming Philadelphia horse-show.

Dr. Charles Williams, of Philadelphia, was fined twenty dollars cash and costs by the authorities of Montgomery County for docking the tails of a pair of ponies.

Dr. Harry Walters, of Wilkesbarre, is lecturing on veterinary dentistry at the Veterinary Department of the University of Pennsylvania.

Dr. Herbert Neher recently addressed the New York Microscopical Society on fatty or adipose tissue.

Prof. A. Liautard sailed for Europe February 8th, to join his wife and daughter.

Prof. Schwarzkopf, of Chicago, has located at Flushing, L. I., succeeding to the practice of the late Dr. W. T. Simmons.

Dr. James A. Marshall, of Philadelphia, has been elected President of the Belmont Driving Club.

Dr. Herbert Neher, of New York City, has been elected professor of clinical medicine of the American Veterinary College by the Board of Trustees.

Dr. H. T. George has succeeded as meat-inspector for Camden, N. J., Dr. W. B. E. Miller, who has held the position for several years at stated intervals.

Prof. A. H. Baker, of the Chicago Veterinary College, was one of the speakers at the Cook County (Ill.) Farmers' Institute.

Dr. Edward P. Dowd, of the Bureau of Animal Industry, has been transferred from Philadelphia to Boston, Mass.

Dr. E. H. Shepard, of Cleveland, Ohio, is now recovering from a long and serious illness.

Dr. C. H. Doepel, recently assistant to Dr. E. B. Ackerman, has changed his vocation and joined his father in the meat business.

Dr. William Kaul, of St. Mary's, Pa., is associated with his father in the Elk Stock Farm.

Dr. Charles Schaufler, of Philadelphia, holds the important position of assistant general manager of the Union Traction Company.

Drs. E. C. Switzer and F. G. Scannell, former students of the United States Veterinary College, finished their course at the Veterinary Department of the Columbian University.

One of the graduating class of the American Veterinary College was a graduate of the Chicago Veterinary College.

Dr. A. W. Clement, of Baltimore, has been selected veterinarian to the Elkridge Fox-hunting Club Show.

Dr. Charles Lovejoy, of Princeton, Ill., has been appointed State Veterinarian by Governor Tanner, to succeed Dr. M. R. Trumbower. Dr. Lovejoy is not a graduate of any veterinary college.

Assistant Secretary of Agriculture, Dr. Charles Dabney, has been placed in charge of all the scientific work of the Department of Agriculture.

Veterinarians Olof Schwarzkopf and F. T. McMahon are enthusiastic members of the Chicago Equestrian Club.

Dr. M. J. Dunn, of Detroit, is President of the Michigan State Protective Horseshoers' Union.

Dr. Charles Bridge, of Philadelphia, met with a serious accident by falling from a trolley car, sustaining a concussion of the brain.

President McKinley has recently provided himself with a Kentucky saddle-gaited horse. Mayor Harrison, of Chicago, will follow his father's footsteps as Mayor in ranging over the municipal domains of his city on a gaited saddle-horse.

SOCIETY PROCEEDINGS.

PENNSYLVANIA STATE VETERINARY MEDICAL
ASSOCIATION.REPORT OF THE COMMITTEE ON SANITARY SCIENCE AND POLICE.¹

MR. PRESIDENT AND GENTLEMEN: As chairman of the Committee on Sanitary Science and Police I beg to submit to you the following report of the infectious diseases of animals as they have come under my observation during the past year and to make some statements in reference to the work of the State Live-stock Sanitary Board. The State Live-stock Sanitary Board has at this time been in operation for approximately one year. The State Veterinarian was appointed on January 1, 1896, and the Board was organized and its rules and methods were formulated shortly thereafter. It was not, however, until about this time last year that active work could be undertaken, so that my present report relates chiefly to observations that have been made since our last annual meeting.

The extent of the work that has been done during the past year and the rapidity with which it has grown indicate the manner in which the operations of the State Live-stock Sanitary Board have been accepted by the owners of animals and by the veterinary profession.

Inspections have been made in nearly every county of the State; in some counties they have been very numerous. It is gratifying to note that applications for assistance from the owners of animals afflicted with contagious diseases, particularly tuberculosis, are most numerous and are increasing in number most rapidly from those sections in which the most work has already been done.

A large number of diseases have been brought to the attention of the Live-stock Sanitary Board, among which I wish to mention the following as being of special interest and importance.

Cornstalk disease is an affection which has prevailed extensively in the corn-growing districts of the West, and particularly in Iowa, Nebraska, and Kansas, for a number of years, but very few outbreaks have been reported from the Eastern States, and so far as I know the disease has not been recognized in Pennsylvania until the present season. During the past few months several outbreaks of disease among cattle have been reported and investigated that were characterized by the following features: excitability, abdominal pain, disinclination to move, constipation, weakness, paralysis, and death. In every instance thus far it has been possible to determine that cattle thus afflicted were fed on cornstalks that were in a mouldy condition. In one outbreak that I looked into recently in Lebanon County it was found that six cattle had died. During the day they were kept in a yard that was littered with corn-fodder from a stack in an adjoining field. The fodder was very mouldy, and the stalks were thickly coated with a grayish mould near the base of the leaf. The yard was cleaned up and the use of this fodder discontinued, since which time there has been no recurrence of the disease.

¹ Read before the annual meeting at Philadelphia, March 2, 1897.

This disease has been the object of a special investigation conducted under the auspices of the United States Bureau of Animal Industry, but it has not yet been determined whether it is due to the infection of the animal by a fungus or bacterium that exists in the corn-fodder, or whether the disease is a toxæmia resulting from the ingestion of the chemical substances produced by the organisms that multiply in corn-fodder under certain conditions.

Dr. Edwin Hogg, of Kirkwood, Lancaster County, successfully treated six cows afflicted with this disease, while an equal number in the same herd died. His treatment consisted in administering Glauber's salt and the use of atropine subcutaneously. The paralyzed animals were raised in slings twice a day and kept up for a short period each time.

Post-mortem examination of animals dead of cornstalk disease usually reveals a negative condition. Sometimes there is an effusion of serum in the connective tissue about the kidneys, and the lungs may be somewhat congested or œdematous. The fact that the lesions are so slight tends to support the view that the disease is a poisoning due to the ingestion of the substances mentioned.

Abortion of cows is a disease that has occasioned great losses in many parts of the State, and particularly in the dairy districts. Many cases have been reported in which it recurs in herds from year to year, so that the profit from the herd is entirely destroyed, and in some instances the losses that result from this cause are ruinous. The disinfection of the premises and the disinfection of the genital passages and organs of the cows usually result in at least an amelioration of the condition. The subcutaneous injection of a weak solution of carbolic acid is also highly recommended by some who have tried it, and my own experience with this method of treatment has encouraged me somewhat. As yet it is not possible to explain how carbolic acid administered in this way and in such small quantities could have a beneficial action, but Dr. M. E. Conard, of West Grove, who has used it in a number of outbreaks, has great faith in its efficacy.

The cause of abortion is still undetermined, and this should be a fruitful field for investigation. So long as the cause of the disease remains unknown all measures directed against it are like fighting an enemy in ambush, but as soon as the cause is discovered and its characteristics are made known the sanitarian has decidedly the best of the contest.

Hog-cholera has prevailed extensively all over the United States during the past season. It is estimated that the loss in Iowa resulting from this disease alone has amounted to more than \$10,000,000 during the past twelve months, and while other States have not suffered so excessively they have likewise lost extensively. Most of the outbreaks that have appeared in Pennsylvania have occurred as the result of the introduction of Western hogs for fattening. Stock-hogs from the stock-yards in Chicago and Buffalo have nearly all of them been exposed to hog-cholera, because the disease has prevailed to such an alarming extent that it is scarcely possible for a susceptible animal to pass through a stock-yard or to be shipped in undisinfected stock-cars without being exposed to the contagion of this affection. When once introduced into a farming district in this way hog-cholera is spread by the interchange of animals or objects that have been in contact with them. In some instances the spread of the disease has been hindered or prevented by quarantining infected herds and confining them strictly to

the premises of their owners. Some of the outbreaks that have occurred during the past season have been characterized by the extreme rapidity with which they have spread and destroyed their victims.

In my last annual report, for the year 1896, I stated that the total losses from this cause would probably amount to \$350,000. Subsequent observation and correspondence have convinced me that my estimate was too low, and that the losses amount to at least five or six hundred thousand dollars.

Since the work of the Live-stock Sanitary Board is wholly new and in a condition of development, active measures relating to the control of this disease have not been undertaken with the exception of quarantining some of the infected herds, and in that way protecting swine of the immediate vicinity, and the distribution of a bulletin entitled *Hog-cholera and Swine-plague*, issued by the Bureau of Animal Industry. It is hoped that more effective measures can be devised and inaugurated before long.

Osteoporosis has prevailed to an alarming extent, or at least a large number of cases have been brought to my attention, during the past year. It may be, however, that the increase is more apparent than real, but it is evident that a large number of horses are incapacitated from this cause, and a number of vague and indefinite lamenesses result from this disease. The cause of osteoporosis is still undetermined, and until we have more information on this point all attempts to cure or prevent the disease will be purely empirical and probably to a large extent unsuccessful.

Glanders has not prevailed extensively. It may be, however, that since the dangers of this disease are so thoroughly understood only a portion of the cases that are dealt with by veterinarians and local authorities are reported to the Live-stock Sanitary Board. During the past year twenty-six horses with glanders were destroyed.

It has been shown beyond doubt during the past season that many of the outbreaks reported as anthrax are beyond doubt red water, and it seems probable that there is not nearly as much anthrax in this State as was formerly supposed. However, the genuine disease has appeared in Pennsylvania, and the State Live-stock Sanitary Board will have prepared and ready for use some vaccine to be employed in preventing this disease whenever it is necessary to use it.

The investigation of rabies, made under the direction of the State Live-stock Sanitary Board, has included visits to and inspections in the districts in which the disease has appeared, the tracing of animals reported as rabid and animals bitten by them, the inoculation of rabbits from the brains of dogs and other animals reported as rabid, and the quarantining and destruction of dogs and cattle in the acute stage of rabies and when they have been bitten by a dog that was undoubtedly afflicted with this disease. These investigations have demonstrated conclusively that rabies actually exists, and during the past season to quite an alarming extent, among the domestic animals of the State. It has been remarked that some outbreaks of the disease are of an excessively virulent and others of a comparatively mild nature—that is, some dogs produce rabies in nearly every animal bitten by them, while others produce rabies in a comparatively small proportion of the animals bitten, and sometimes the disease appears in the paralytic or dumb form. Variations in the strength of the virus of this disease have been studied for a long time, and have been produced artificially in laboratories, and it has been observed that under certain conditions

the disease becomes progressively milder until finally the virus loses its virulence to such a degree that it will not produce the characteristic symptoms of this disease, but by passing this attenuated virus through an animal of different species its virulence can be restored, and it has been suggested that rabies of dogs always has a tendency to become milder with each succeeding generation, and unless another animal, a cat, for instance, is bitten and in turn bites a dog, thus propagating the disease, it will in time become practically harmless. There are some places in this State where rabies is stationary and cases among dogs are of frequent occurrence, but of such a mild type as to cause but little apprehension. But occasionally a dog in the furious stages of the disease will appear and bite animals or people and cause much alarm in a large territory, and a number of cases of rabies often follow a raid of this sort. While all undue excitement should be avoided, it appears that there is no good purpose to be accomplished by hiding the facts connected with this disease, but it should be explained fully and freely that the existence of rabies constitutes a serious menace to communities in which it exists, but that all dogs that have fits, become excited, or bite, are not mad, and that rabies is a comparatively rare disease, the diagnosis of which is attended by some difficulty.

The greatest attention has been devoted during the past year to the subject of tuberculosis of cattle. The question as to how to deal with this disease in the most profitable and satisfactory manner has been a difficult one to solve, and it has received the earnest consideration of the State Live-stock Sanitary Board. A great number of possible methods have presented themselves and have been suggested, but most of them have been rejected on account of obstacles that are not surmountable at this time. The plan that is pursued at present is to examine herds wherever and whenever examinations are applied for, but only upon receipt of a formal application which contains an agreement upon the part of the owner to do all in his power to prevent the reintroduction or development of tuberculosis in his herd, and to observe the precautions and measures recommended by the State Live-stock Sanitary Board for this purpose. Upon the receipt of an application of this kind a tuberculin-test of the entire herd is ordered, and the animals that prove to be tuberculous are appraised and destroyed, although an alternative has been provided in accordance with the following rules: When herds are examined and tested at the request of the owner: (a) Cattle that present physical symptoms of tuberculosis must be destroyed, after an arrangement as to their value has been made that it is satisfactory to an authorized representative of the State Live-stock Sanitary Board and to the owner or his agent, or after the cattle have been regularly appraised. (b) Cattle that respond to the tuberculin-test, but do not present physical symptoms of tuberculosis, and in particular, have healthy udders, may be kept by their owners, subject to the following conditions: 1. The tuberculous cattle shall be marked with a suitable tag in the ear, or otherwise, and quarantined on certain defined premises. These cattle shall be kept apart from other cattle and in buildings and enclosures in which other cattle are not kept and are never allowed to go. Or, if it is impracticable to provide a separate building for the tuberculous cattle, they may be kept in a building in which other cattle are stabled; provided, they are separated from other cattle by a tight partition, the construction of which is satisfactory to a representative of this Board, which divides the building

into two entirely distinct apartments with separate doors, separate accommodations for feeding and watering, and separate yards. 2. The calves from these quarantined cows may be raised, provided that they shall, immediately after birth, be removed from the premises in which tuberculous cattle are kept, and that they shall not be allowed to drink any of the milk from their dams or other quarantined cows, except after boiling or heating to 185° F. 3. The milk from cows so quarantined shall be used for no purpose whatever, except after it has been boiled or heated to 185° F. 4. Cattle quarantined as above may be slaughtered for beef; provided, that they shall be inspected at the time of slaughter by a competent inspector approved by this Board, and the flesh must be destroyed or may be sold for food, according to the judgment of such inspector; and provided further, that when this alternative is selected it shall be in lieu of indemnity from the State Live-stock Sanitary Board, and all claim for indemnity is thereby forfeited, except for such animals as are condemned by the meat-inspector, in which case the appraised value shall be paid. (c) If the owner of cattle that have responded to tuberculin-tests elects to accept the indemnity provided by the law, and so informs the authorized representative of the State Live-stock Sanitary Board, such cattle will be appraised, destroyed, and examined post mortem under the direction of a representative of the Board.

This arrangement has been made for the purpose of accommodating the owners of animals who do not wish to have them appraised and destroyed immediately after they are tested and found to be afflicted with tuberculosis. The conditions are such that it is not possible for tuberculosis to be spread by cattle kept in accordance with them, and, although they may not permit of the convenient utilization of tuberculous cows, it does not at this time seem possible to moderate them in any degree without endangering the live-stock interests.

One great difficulty that has confronted the Board in its work has been in relation to supplying a source to which farmers can go for cattle that they may be sure are free from tuberculosis, for the purpose of restocking herds from which tuberculous cattle have been removed. Cattle-buyers are recommended to purchase no cattle that they have not good reason to believe are free from tuberculosis, and since one cannot ascertain this point satisfactorily without the tuberculin-test, in these cases in which it is not possible to visit the herds from whence the cattle that are offered for sale come, and since it is not practicable to insist on a certificate of health based upon the application of the tuberculin-test in all cases, it has not always been possible for farmers to buy cows that they should be sure about. It has been suggested that this difficulty can be overcome by providing that all cattle coming into Pennsylvania from other States shall only be admitted upon presentation of evidence that they are entirely free from tuberculosis, and a bill has been introduced before the present Legislature that will establish this requirement. This will make it possible for farmers to purchase cattle that they can be sure about, and will be a long step in advance of our present position, and at the same time will not add to the expense that the State is already put to. About six thousand cattle have been tested with tuberculin under the direction of the State Live-stock Sanitary Board, and of these about one-fourth have been condemned; but, of course, this does not represent the actual percentage of tuberculosis among the cattle of our State, because inspections have only been made in herds that

were supposed to be infected. However, many of those herds that were supposed to be infected have proved entirely free from tuberculosis. The percentage of tuberculosis in herds has varied from 1 to 100 per cent., and week before last a herd comprising about 175 was found to be tuberculous to the extent of 95 per cent. It has become perfectly evident that the percentage of tuberculosis in the herd depends principally upon the length of time that the infection has existed. In old cases of infection, particularly in breeding herds, the entire stock is sometimes saturated with the disease; whereas, if the infection is recent a comparatively small number of animals are found to be afflicted, perhaps not more than one or two. The sanitary conditions also determine to some extent the rapidity with which tuberculosis spreads in a herd. Notwithstanding the general views in regard to this point and my own preconceived opinions upon it, I have not been able to demonstrate to my own satisfaction just what influences are most favorable or most unfavorable for the rapid transmission of this disease. It is quite easy to deduce inferences on this subject based upon our knowledge of the disease, the vitality of the tubercle bacillus, etc. While these inferences may seem to be supported in some isolated cases, the careful observer will find many illustrations of exceptions to what he has supposed should be the rule. For example, tuberculosis has been known to spread with great rapidity among animals kept in well-ventilated stables and stables that were well lighted, and even out of doors, while the cattle were at pasture. Some observations made in Iowa and some made in Scotland show that tuberculosis can spread extensively in herds that are never stabled.

Since it has been shown conclusively that heredity has but little part in the transmission of tuberculosis, there has been a general tendency among writers on this subject to dwell upon the importance of the inherited predisposition to the disease. But the very careful and extensive work conducted in Denmark by Prof. Bang seems to show that after all this is a matter of minor consequence, and general observation indicates that contagion, actual exposure to cattle afflicted with tuberculosis is the thing that is the most important to guard against, and if this is guarded against thoroughly the most important precaution has been taken.

It is, however, exceedingly important that one should know the exact value of good sanitary conditions, and what sanitary arrangements are best adapted to prevent the rapid spread of tuberculosis in a herd. A great many diverse opinions prevail on this subject, and a great many cheap views on it are aired from time to time in the public prints, but there is a great lack of accurate information and demonstrated facts that would be of great value and should be supplied. The State Live-stock Sanitary Board has realized the need of further knowledge in reference to many of the diseases of animals, and has instituted a laboratory at the Veterinary Department of the University of Pennsylvania, wherein investigations can be made and where tuberculin, mallein, anthrax vaccine, and black-leg vaccine are prepared. Several investigations are now under way, and it is earnestly hoped that the facilities for this work can be increased in proportion to its importance, so that more of the many vague and perplexing questions that beset the veterinarian may be studied and more effective means for the prevention and cure of diseases among animals may be developed.

I wish to thank the veterinarians of this State for their indispensable and ever-ready assistance whenever they were called upon to aid in the work of

the Live-Stock Sanitary Board; the kind and willing manner in which they have responded to all calls made upon them has been exceedingly gratifying, and without it the results attained would have been impossible.

The fact that the live-stock industry of Pennsylvania represents approximately \$125,000,000, and suffers losses approximating \$6,000,000, as a result of diseases that are probably preventable, indicates the importance of the work that is going on under the direction of the State Live-stock Board.

This work will unquestionably grow in importance and extent, and that it may grow in such a way as to yield the greatest return for the money expended it is to be hoped that provision can be made for more extensive researches that will lead to a better understanding of the best means for the suppression of these numerous diseases, and this can only be learned by a more careful study of their causes, their exact methods of transmission, the conditions that are favorable and unfavorable to them, etc.

LEONARD PEARSON, V.M.D.,
Chairman.

VETERINARY MEDICAL ASSOCIATION OF NEW JERSEY.

THE thirteenth annual meeting was held at the Continental Hotel, Newark, N. J., on April 8, 1897. Meeting called to order at 11.30 A.M., President Hawk in the chair. There were but fifteen members present. After the roll-call, the minutes of the previous regular meeting were read and approved, also the minutes of a special meeting held on December 22, 1896.

The Secretary's report showed a steady growth in numbers, and the Treasurer's report a rapid increase financially. There was but one applicant for membership present—Dr. F. A. Zucker, of Elizabeth—who was unanimously elected after being examined by the Board of Censors.

The election of officers resulted in the unanimous election of President, Dr. W. H. Arrowsmith; First Vice-President, Dr. R. C. Vail; Second Vice-President, Dr. W. Runge; Secretary, Dr. S. Lockwood; Treasurer, Dr. B. F. King; Trustees, Drs. W. Runge, J. W. Hawk, A. W. Oxford, W. Gall, and B. F. King, all being elected for two years.

The essayists being absent, Dr. Arrowsmith gave a description of an operation which he had performed—a laryngotomy for the removal of an osseous growth, which caused roaring, and he exhibited the electric lamp and instruments used. The operation was performed at his hospital in Jersey City, and was successful.

The President, in his address to the Association, emphasized the necessity of each member trying to improve the meetings by being more prompt at the time appointed, reporting interesting cases, inviting others of the profession to join the Association, and, when the Association is trying to get new laws passed, not to leave all the work for the committee, but each one see the member from his district and explain the need of such a measure; then when he sees the bill he will take an interest in it. Adjourned at 1.15 for dinner.

Reconvened at 2.45 o'clock. Dr. Dustan, chairman of the Legislative Committee, made a report of the work of the committee and of the defeat of the bill, after going to third reading in the House. The bill was the same as the New York and Pennsylvania bills providing for a State Board of Veterinary Examiners. The report was accepted and the committee discharged. The Secretary read a letter from the Pasteur Monument Com-

mittee. Dr. Vail told of the action taken by the Pennsylvania Association, and moved that we give a like amount; motion lost. Moved and carried to pass a subscription paper, and let each contribute what sum he desired. The Secretary was instructed to write each member who was not present, giving all an opportunity to contribute.

The President appointed as delegates to the New York State and County Associations Drs. W. Runge, R. C. Vail, and J. W. Hawk; to the Pennsylvania Association Drs. F. A. Zucker, J. C. Dustan, and William Gall; essayists for next meeting, Drs. William Gall, W. Runge, A. D. Edwards, and B. F. King.

Moved and carried to meet at Trenton in October. Adjourned at 5 P.M.

S. LOCKWOOD,
Secretary.

VETERINARY ASSOCIATION OF THE DISTRICT OF COLUMBIA

THE thirteenth meeting was held at Elks' Hall, March 27, 1897, at 8 P.M. All the leading veterinarians of the district were present. The minutes of the previous meeting were read and approved. One new member was elected.

The President appointed a Legislative Committee, consisting of Drs. Turner, Buckingham, and Pearson, to look after the interests of the bill to regulate the practice of veterinary medicine in the District of Columbia which failed to come up during the Fifty-fourth Congress.

The following officers were then elected for the ensuing year: President, Dr. H. Acheson; Vice-President, Dr. D. E. Buckingham; Secretary and Treasurer, Dr. J. P. Turner; Trustee, Dr. Pearson.

The Auditing Committee audited the Treasurer's account, after which several motions were approved relating to initiation fees and yearly dues.

A motion was made to call the next meeting on the last Saturday night in May, and thereafter on the last Saturday night of each alternate month. Approved.

Dr. C. B. Robinson brought forward the subject of "Tuberculosis" for general discussion, paying especial attention to the use of the meat and milk of tuberculous animals, wishing this Association to take a definite position as to whether the meat or milk of any tuberculous animal, no matter how slightly diseased, should be permitted in the market. The subject brought forth a very interesting general discussion, which lasted until 11.30 P.M., when it was decided that each member should prepare a short article on the subject, quoting authorities, for the next meeting, when it is hoped a stand will be made on this very important subject.

Moved and seconded that the meeting adjourn. Approved.

J. P. TURNER,
Secretary.

CHICAGO VETERINARY SOCIETY.

THE meeting was called to order on Thursday evening, April 8th, by the President, Dr. Walker. The minutes of the previous meeting were read and approved. The President made some remarks as to the small attendance, there being only thirteen members present. He requested that the

members try to attend earlier, as only ten were present at 9 o'clock, which number is not a quorum. There was no report from the Secretary or Treasurer.

The Telephone Committee did not call on the Telephone Company, owing to the fact that it had come to their knowledge that the company would not consider our application for free telephone use of the slot-machines at drug-stores to call up our own homes and offices, but that the company would consider such an application if made by the druggists. Dr. Walker, of the committee, reported that one druggist had promised to bring up the matter at the next meeting of the druggists.

There were no applications for membership and no unfinished business.

Dr. Gysel, the essayist of the evening, telephoned just previous to the meeting that, owing to the illness of his wife, which was of a serious nature, he would not be able to attend to read his paper on "Operative Treatment of Quittor."

Under new business a letter was read from Dr. John W. Foster offering his resignation to the Society, as he intended leaving Chicago to locate in Springfield, Ohio. Moved and seconded to accept his resignation.

A letter to Dr. A. H. Baker was read from Dr. D. E. Salmon, chairman of the Pasteur Monument Fund. Dr. Baker thought the letter should be considered by the Society. Moved and seconded that, as the communication was not addressed to the Society it be laid on the table, and that the same be returned to Dr. Baker with an explanatory letter.

A very amusing card was shown the members by Dr. Robertson. This card was printed, and was the business card of a would-be veterinary surgeon, who guaranteed to cure, among other affections, CRIBBIN and THISALOE. He also called himself a VETERIANIARY SURGEON. It is a good sample of some of our Western quacks.

Dr. Walker mentioned the fact that our Honorable Governor, Tanner, had appointed for State Veterinarian one Charles P. Lovejoy, of Princeton, Ill., who is a non-graduate and a strong opposer of college qualifications. This appointment was made in the face of strong personal and written opposition to the Governor by a large number of graduated veterinarians throughout the State of Illinois.

On motion, adjourned.

L. CAMPBELL,
Secretary.

MONTREAL VETERINARY MEDICAL ASSOCIATION.

A SPECIAL meeting of the Association was held in the Library of the Faculty of Comparative Medicine, March 25th, at 5 o'clock. Owing to the illness of the President, Dr. Baker, and his consequent absence, the chair was occupied by Prof. Adami. After the Acting Secretary had read the minutes of the preceding meeting, and of the corresponding meeting of last year, the chairman addressed those present, and in concluding his remarks extended his best wishes to the graduating class, and trusted that they would maintain the well-deserved reputation of their school.

The Acting Secretary then presented the annual report, which showed the Society to be in a sound financial condition, and the Librarian made a few remarks with regard to the condition of the library.

Dr. Adami then made his report upon the essays read before the Society

during the past session, the awards being as follows: The first prize was won by Mr. J. C. Parker, his essay being entitled "Artificial Impregnation;" the second prize by Mr. B. A. Sugden, "Pneumonia;" and the third prize by R. G. Matthew, "Peritonitis." In Dr. Adami's opinion the best work was brought before the Society by case-reports, and he thought it would be wise if these were in the future taken into account in awarding prizes.

The diploma of honorary fellowship was then conferred upon the following gentlemen: Messrs. Burns, Connelly, Hilliard, Killam, Moore, Matthew, Newcombe, Parker, Stevenson, Sugden, and Thayer.

Dean McEachran then addressed the meeting, urging upon the graduating members the importance of keeping up their connections with societies and subscribing to magazines, stating how, during his recent examinations of professional men in connection with government inspection, he had especially noticed the capable and up-to-date manner in which those gentlemen who maintained these relations had handled their subjects. Alumni societies, he said, which existed in New York, British Columbia, etc., were branching out from being merely headquarters for friendly gatherings to include the study of scientific subjects, and it was only at the last meeting of the McGill Alumni Society of British Columbia that they had voted fifty dollars, to be equally divided as prizes among the five faculties of McGill University; also that the Massachusetts Alumni Society of the Faculty of Comparative Medicine of McGill had voted a prize especially for the examination of horses for soundness. In an able manner he pointed out the difficulties the profession had overcome in order to reach its present position; how already Great Britain, Canada, and the United States were recognizing its importance, and how, without being a prophet or a prophet's son, he could see the day close at hand when the people of these countries, who at present, owing to ignorance, were daily poisoning their families with tuberculosis and other contagious diseases through neglecting the proper care of their domestic animals, from which their food was derived, would demand that every pound of beef, pork, or milk should have the professional stamp upon it as being fit for consumption ere it was placed on the market. As regards horses, he showed how the general drudge of the past, oftentimes a cripple, was rapidly being replaced by electrical machines, in consequence of which the horse of the future will be a valuable animal and in most cases a family pet, necessitating for his medical attendant an educated gentleman, who, like his brother in human medicine, must be capable of understanding his patient's psychic qualities. In conclusion, he expressed his best wishes for the departing students and congratulated the Society upon the useful work it was doing.

After a short address from Dr. Parker a vote of thanks to Dr. Adami was proposed and carried unanimously, after which the meeting adjourned.

B. A. SUGDEN,
Secretary-Treasurer.

VETERINARY MEDICAL SOCIETY OF HARVARD COLLEGE, CLASS OF '99.

THE regular monthly meeting was called to order by President Kennelly, of Springfield, Mass., March 25, 1897. Many subjects of importance were discussed, among which was an original essay by J. Francis Connors, on the "Luxations of the Patella."

New officers were elected as follows: President, J. Francis Conners, South Boston, Mass.; Vice-President, T. J. Coyne, Charlestown, Mass.; Treasurer, Willis A. J. Dillingham, Berwick, Maine; Secretary, J. E. Kennelly, Springfield, Mass. Board of Directors: Daniel P. O'Brien, Chairman, Chelsea, Mass.; Clifton Bowley, Lynn, Mass.; W. Lowering, Milford, N. H.; and N. C. Koons, Roxbury, Mass.

Mr. Dinsmore and Mr. Wadsworth were appointed to wait on the dean in reference to certain original investigations.

The Class of '99 has representatives of all the New England States. The regular monthly meetings will take place on the second Monday of each month.

C. BOWLEY,
Secretary.

VETERINARY MEDICAL SOCIETY OF THE UNIVERSITY OF PENNSYLVANIA.

THE regular bimonthly meeting was held Friday evening, April 2, 1897. Meeting called to order at 8 P.M., President Klein in the chair. Twelve members answered to roll-call. Minutes of previous meeting read and approved.

Committee reported that Dr. Adams would donate the Society the VETERINARY JOURNAL for three years back, and keep us supplied with the same in the future. Committee reported that Dr. Harger would donate the Society a copy of *The Exterior of the Horse*. Receipts of the evening were two dollars and ten cents. The Committee on Library Rules reported a set of rules, which, after various amendments, were adopted and the committee discharged with thanks.

The Librarian reported that he had received agricultural reports from Pennsylvania and New York, and also some literature donated by Dr. Hoskins.

Dr. Ravenal was elected an honorary member of the Society.

Mr. Marshall, class of '97, read a very interesting paper on "Rabies." Critic Bower reported.

The programme for the next meeting was read by Mr. Shaw. The meeting adjourned at 10.15 P.M.

The regular bimonthly meeting was held on Friday evening, April 23, 1897. Meeting called to order at 8 P.M., President F. Klein in the chair. Sixteen members answered to roll-call. The minutes of the previous meeting were read and approved.

The Committee on Writing an Article for the *College Annual* reported that no medical society would be allowed to publish an article in that journal. On motion of Mr. Hershman, the committee was discharged, with thanks. The Committee on Letters of Inquiry made a final report and was discharged, with thanks, on motion of Mr. Beatty.

On motion of Mr. Shaw the regular order of business was then suspended, and Dr. Adams was introduced, who addressed the Society on "Examination for Soundness," giving a demonstration with one of the Department horses.

On motion of Mr. White the thanks of the Society were unanimously tendered the doctor for his kindness.

Mr. Shaw, on behalf of the Executive Committee, then read several estimates for printing new society certificates. On motion of Mr. Beatty the

committee was authorized to purchase a better quality of certificate than that at present in use.

Critic Zaner made a favorable report.

The Society adjourned at 11.10 P.M.

JOHN E. SPINDLER,
Secretary.

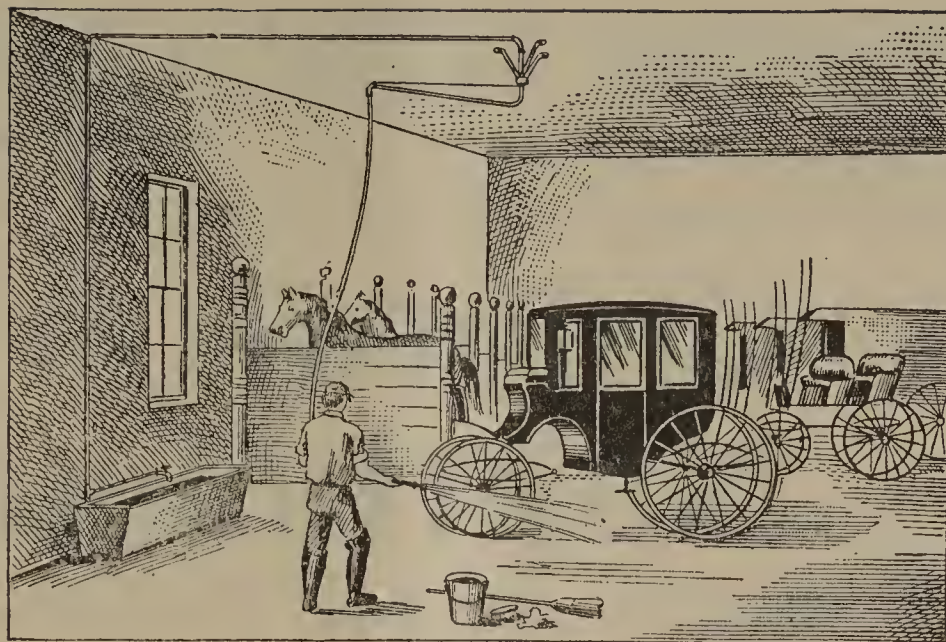
U. S. V. M. A.

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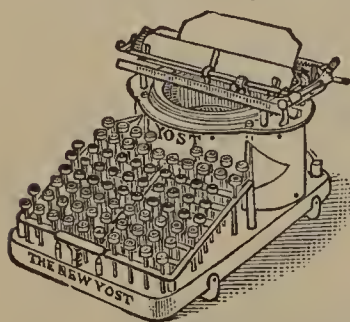
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Unsatisfactory results. Reasons. In studying unfortunate and unsatisfactory results of eserine we must not forget that there are two alkaloids in the calabar bean which are diametrically opposed in physiological effects, and that a commercial sample of eserine is liable to be contaminated with calabarine. Again, eserine in the presence of acids takes up water and changes to eseridine, which has at the best but one-sixth the activity of eserine. These alkaloids are quite easily separated because of their differing solubilities. For instance, eserine is soluble and calabarine insoluble in ether.

When using pilocarpine it must be remembered that jaborandi also has two alkaloids that are antagonistic in physiological effects, and that pilocarpine is changed into jaborine by oxidation or by heat alone. Jaborine is more easily soluble in ether and less easily soluble in water than pilocarpine. Commercial pilocarpine may be contaminated with jaborine. We must not blame pilocarpine too readily; the fault may not be in the pilocarpine.

Again, patients vary greatly in susceptibility to all the drugs commonly used for cathartic effects. Drugs may be old and have deteriorated, or they may be adulterated. In cases wherein several drugs are used—for instance, in hypodermic cathartics—in which either or all of those used in my experiments may be given, the combination may be a poorly balanced one—for instance, in combining eserine or pilocarpine, or both, with atropine. The addition of a very small amount of atropine, say 0.05 or 0.04 of a grain, may be very desirable, whereas if the dose had been increased to 0.1 grain the eserine is neutralized to such an extent as to make that amount of atropine very objectionable. Too much of a drug may be given, or too little, for satisfactory results. Finally, in considering the results of a cathartic which has been unsatisfactory, we should not lose sight of the condition of the bowels at the time of administration. The condition of the stomach, after a full feed or before, may have much to do with determining a cathartic effect, as, for example, barium experiments 1, 2, and 3.

We were all taught when we were students, I have no doubt, that when a horse is feverish and consequently constipated that effects are apt to be slow and indefinite; that a horse should never have a full purgative when weak from pre-existing illness or depressed from any cause; that purgatives should be administered with extreme care in inflammatory diseases of the respiratory organs,

and very rarely when any portion of the alimentary canal is suffering from an inflammation.

Of 98 experiments the following have been quite unsatisfactory : Eserine experiments, 6, 9, 12, 13 (fatal), 14, 17, 19, 20, 21, 22, 23, 26, 30, 32, 37, 40, 48, 53, 55, 56, 58 ; also barium experiments, 16, 19, 24, 28, and 32. (For doses and results, see Tables D, E, and F.)

E. (13). Brown horse ; poor condition ; quite old ; weight, 1200 pounds. Dose, 3 grains eserine at 12 M. This horse was poor and weak and supported in slings at the hospital at the time of this experiment. On the basis of 3 grains per 900 pounds this horse actually received 4 grains. The purpose of the experiment was to study the effect of such a dose upon a horse in his condition, and then to post-mortem the horse and study the effect upon the mucous membrane involved. This was evidently a very sick horse from the time the medicine took effect until he was dead. The disturbance was in general *violent*, such as a practitioner would not care to see in actual practice. The pain was very severe, and the feces effect also very severe, with six discharges during the first hour and thirteen during the first three.

Post-mortem : Subject "John." Died suddenly at 5 P.M. Post-mortem at 5 P.M. November 14th. Normal except as noted ; only alimentary canal was examined. *Cæcum*—Arch and also meso-cæcum show large, bright blush, with somewhat darker pin-head spots. *Large colon*—First portion and suprasternal flexure similar but less marked. *Ileum* shows same condition, practically whole length. *Jejunum* terminal, $\frac{1}{2}$, same condition. The congestion or hyperæmia involved noticeably the muscular coat. As normals could not be obtained for this experiment, the writer was therefore unable to make comparison of them with those obtained under effect of medicine. Feces, first catharsis at 12.35; 6 during the first hour, 5 during the second, 2 during the third, 1 from 3 to 5; died at 5 P.M. Total number to that time, 15. Total weight, 9.07 pounds. Tenesmus evident during the whole time after the effect of medicine appeared until horse died. Slight pain at 12.25. Considerable gas. Began perspiring very freely at 12.40, which continued until death. At 5 o'clock, just before dying, the heart-action was irregular and violent, with pulse 36 and weak. Dropped suddenly into slings and died.

B. experiment (11). Illustrates a rather large dose of barium with *poisonous effect* in a peculiarly susceptible horse. Dose, 15 grams

at 7 A.M. in bolus. This experiment is interesting in that the horse died, and a post-mortem was obtained showing some interesting developments. Feces recorded for twenty-four hours: Period A, 8 discharges; weight, 32 pounds; normal in all respects. Horse in good health. Period B, first discharge at 7.35; 6 the first hour; 14 the second; 8 the third; 11 from 10 A.M. to noon; 12 from noon until 3.30 P.M. Died at 3.30. Total number for the $8\frac{1}{2}$ hours, 51; weight, 50 pounds. Temperature not materially varied; pulse 60 at 10 A.M.; 54 at noon. Respiration 42 at 9 A.M.; 48 at noon. Slight tenesmus between 7.50 and 8.40; uneasy at 8.45; lay down at 9 o'clock; no excessive pain from 9 until noon. Feces very thin; commenced trembling at 3.30; struggled; fell suddenly at 3.32; struggled to her feet again after considerable effort; immediately fell on left side; leg and body-muscles quivered spasmodically; died very suddenly.

Post-mortem record of Kenwood (black mare). Thoracic cavity and contents apparently normal. Omitted to examine interior of œsophagus. Stomach shows two very distinct areas of intense local inflammation (both in right cul-de-sac and greater curvature). Mucous membrane swollen and purple in two spots just the shape and size of the barium balls; borders sharply defined. She had lain down several times during operation of the physic, and we noticed she would stagger a little and tremble slightly for a moment after rising. She had also acted in the same way during operation of her last dose of barium.

Jejunum and ileum normal. Mucous membrane of cæcum and first, second, and third portions of the colon (less marked on fourth portion) mildly congested. Small colon and rectum filled with soft feces, consistence of cow's feces, dirty gray color. Feces about this same condition throughout the entire canal, all soft and uniform. Very little feces in the small intestines, but throughout this portion there was a great abundance of fluid about the consistence of gravy and about the color of light blue clay. Peritoneal surface of the diaphragm nearly covered with little patches of organized fibrinous exudate—possibly the result of some pre-existing peritonitis, but singularly local.

Brain-substance and meninges apparently normal, except a congestion of each choroid plexus and a decided congestion of the pia mater and inner arachnoid around inferior portions of the cerebellum. The inferior surface of all three lobes of the cerebellum deeply reddened, with raised, swollen appearance—could easily separate a

thin layer from this portion of the cerebellum that resembled a blood-clot, quite firm, difficult to tear.

B. Experiment (32). Shows an interesting result from intravenous use of barium. *Severe local swelling.* Dose, 1 gramme, intravenously, 10 per cent. solution. Feces record, Period A, twenty-four hours; number 8; weight, 22 pounds; normal. Period B, total number, 12; weight, 12 pounds. A distinctly constipating effect. Pain moderate; effect on pupils, *nil*. This experiment was continued during the third period of twenty-four hours, C, to study the effects of this dose upon the feces records, with the following



Stomach. Barium experiment (11).

results: Total number, Period C, 8; weight, 28 pounds. A very unfavorable showing from Period B, when the cathartic effect should have been active. A large swelling slowly appeared on the side of the neck and extended downward perhaps eight inches, and upward about two inches from the side of injection. The next day after injection it was about one foot long and five inches wide, and perhaps an inch and a half above the level. The swelling did not seem painful or annoy the horse, and went down by the 24th. No abscess developed. Horse in good health, eating and feeling well all the time. The vein was not obstructed, as shown by pressure

below the swelling. The needle entered the vein easily, and the blood flowed through the needle very freely, showing that the needle was unquestionably in the vein. The horse stood quietly for the injection, and it is almost impossible that any barium should have been injected outside the vein. In view of this the swelling is difficult to account for.

Unsatisfactory experiences with barium reported by others. (See *Journ. Comp. Med. and Vet. Archiv.*, vol. xvii. No. 7, Mollereau; *Ibid.*, Ries; *Berliner Wochenschrift*, No. 24; *Ibid.*, No. 27; *Vet. Journ. and An. Comp. Path.*, vol. xli. No. 246, Nemo; *Veterinary Magazine*, vol. iii. No. 2, Treacy; *Am. Vet. Review* (from *Berl. Thier. Woch.*), vol. xx. No. 1, Bieser; *Journ. of Comp. Med. and Vet. Arch.*, vol. xvii. No. 9, Plaskett; *The Veterinary Magazine*, vol. iii. No. 7, p. 445, Cary.)

TABLE D.—HYPODERMIC TABLE.
Abbreviations explained at the foot of the table.

Dose.	Name.	Exp. No.	Bowel discharges.					
			No.	Weight.	Pain.	F. effect.	1st hour.	1st 3 hrs.
E .5	Jim, 2d,	19	* 17 15	* 32.5 32.5	o	o	3	3
"	Dick,	22	8 11	30 37	o	o	1	3
E .5 P 1	Jim, 2d.	20	14 12	25.5 32.5	o	o	3	3
E .5 P 2	Dick,	23	8 6	37.5 ...	o	o	0	1
E .75	Lady,	35	9 10	20 28	o	x	1	4
E 1	Jim, 2d,	18	18 46	47.5 76.5	x	xxxx	6	30
"	Josie,	48	10 9	37 24.5	o	— C	1	1
"	Dick,	27	10 10	50 32.5	o	x	2	5
E 1, P 2	Dick,	24	7 14	32 41	o	xx	1	6
E 1, P 2 A .25	Dick,	30	8 9	38 34.5	o	— C	0	0
E 1, P 2 A .08	Dick,	31	10 7	39.5 34.5	o	x	3	0
E 1, P 4 A .08	Dick.	32	10 7	39.5 34.5	o	— C	0	1
"	Dick,	33	10 10	31.5 36.5	o	o	2	2
E 1 P 4 A .04	Dick,	34	11 10	38.5 41	o	x	2	3
E 1.5	Jim, 2d,	17	17 49	47 53	x xxx	See rec. 17 xxx	20	42
"	Josie,	50	9 11	32.5 34	x	o	2	2
"	Dick,	28	8 25	32.5 36.5	xx	xx	16	22
E 1.5, P 2	Dick,	25	9 11	33 35	x	x	2	5
E 1.5, P 4 A .05	C. C.	55	8 13	29 31	See rec. xx	x	Mistake 2	in A. 2
E 1.5, P 4 A .05	C. C.	57	8 13	34 37	xx	xx	3	4
"	Whitey,	56	12 14	40 37	x	— C	Mistake 0	in A. 1
"	Whitey,	58	9 14	31 40	xxx	xx	5	7
"	Kenwood,	54	10 14	33 34	o	x	3	8
E 1.5, P 4 A .14	Dolly,	31 A	... 0	... 0	o	o	H. C. Im 0	paction. 0
E 1.5, P 4 S .5	Lightfoot,	46	... 18	... 25	x	xx	7	17

Dose.	Name.	Exp. No.	Bowel discharges.					
			No.	Weight.	Pain.	F. effect.	1st hour.	1st 3 hrs.
E 2	Jim, 2d,	21	* 15 57	*	xxxx	xxxx	15	47
"	Dick,	29	7 37	39.5 46.5	x	xxx	17	28
"	Jim,	4	16 15	39 32	x	x	0	3
E 2 A .05	Whitey,	59	14 22	42 44	xx	xx	5	7
"	C. C.,	60	12 23	42 42	x	xxx	7	9
E 2, P 2	Jim,	7	9 18	39 37	xx	xx	6	14
"	Jim, 2d,	15	18 47	50 51	xxx	xxx	17	38
"	Dick,	26	8 23	47 52	xxx	xx	13	20
E 2, P 2 A .2	Dolly,	30 A	... 2	... 4	xx	x	H. C. Im 2	paction. 2
"	Dick, 2d,	38	o	o	H. C. Im 0	paction. 0
E 2, P 2.5 S .5	Jim,	11	9 40	26.8 31.5	xxx	xxx	11	35
E 2, P 4	Lady,	37	9 27	23.5 26	xxx	xx	See re 14	cord. 21
E 2, P 4 A .05	Lady,	43	11 19	29 32.5	xx	xx	10	16
"	Lady,	49	13 12	24.5 28	xx	o	3	3
"	Dick, 2d,	39	o	x	See exp. 0	record. 4
"	Dick,	36	10 25	38.5 36	x	xxx	15	19
"	C. C.,	51	8 23	19.5 36	xx	xx	9	14
"	Whitey,	52	15 15	32.5 40	xx	xx	7	8
"	Kenwood,	53	9 29	33 42	xx	xxx	4	20
E 2, P 4 S .25	Lady,	47	* 10 32	* 26 24.25	x	xxx	15	26
"	Dick,	44	11 22	33 42	o	xx	7	17
E 2, P 4 S .5	Lady,	45	11 16	20.25 25	xx	xx	2	14
"	Dick, W. W.,	41	... 13	... 21	o	xx	4	12
"	Dick,	42	9 32	38 54.5	o	xxx	20	28
E 2.5, P 2.5	Jim,	9	4 27	19.3 27.2	xxx	xxx	4	25
"	Harry,	8	7 14	25.7 31	xx	xx	5	12

Dose.	Name.	Exp. No.	Bowel discharges.					
			No.	Weight.	Pain.	F effect.	1st hour.	1st 3 hrs.
12	Kenwood,	6	* 7 49.	* 29 43	x	xxx	6	32
12	Whitey,	8	11 11	34 32	o	o	0	1
12	C. C.,	7	10 28	31 36	x	xxx	4	18
11.6	Nick,	19	9 11	27 ...	o	— C	1	2
12.5	Queen,	9	... 13	... 53	o	x	1	4
12.5	Brownie,	20	14 11	32 ...	x/2	x	1	2
12.5	Brownie,	27	11 13	34 44.5	xx	Active 12 M. to 5 P.M.		1
12.5	Nick,	25	9 14	29.5 37	o	x	1	4
12.5	Kit,	24	12 12	54 57	o	o	0	1
12.5	Prince,	26	10 34	44.5 84	Gaunt and much depressed afterward.		3	10
15	Kenwood,	11	8 51	32 50	xx	xxxx	8½ hrs. then died. 6	28
20	Whitey,	13	11 28	26.5 51	xx	xxx	Active 12 M. to 5 P.M.	
15	C. C.,	12	9 48	31 40	xx	xxx	13	35
15	Queen,	10	... 11	... 40	o	x	0	0
19.1	Nick,	23	8 14	24 33	x	x	1	3

TABLE F.—BaCl₂, INTRAVENOUS.

Dose.	Name.	Exp. No.	Bowel discharges.					
			No.	Weight.	Pain.	F. effect.	1st hour.	1st 3 hrs.
0.75	Whitey,	18	10 16	33 34	o	xx	9	12
0.75	C. C.	17	11 30	28 32	x/2	xx	12	20
1	Whitey,	21	12 24	39 40	o	xx	11	12
1	C. C.,	22	9 28	37 42	x/2	xxx	14	15
1	Nick,	32	8 12	22 12	xx	— C	1	4
1	Dandy,	31	16 20	37 27	x/2	x	7	9
1.5	Whitey,	28	12 14	42 35.5	xxx	xx	7	9
1.5	C. C.,	30	11 43	41.5 42	x/2	xxx	28	38

Abbreviations same as in Table D.

Doses quoted on a basis of 1000 weight and expressed in grammes.

Doses administered in 10 per cent. solution.

The following comparisons are made in view of similar doses, the differences being only such as necessary to furnish the desired data. The number of bowel discharges for twenty-four hours, the weights of the same, the pain effect with general disturbance, and the general bowel effects. The number of discharges during the first hour after the administration of the medicine, or after the first appearance of the cathartic effect, and the number during the first three hours after that time, are also considered. (See Tables D, E, and F.)

As to the *value of pilocarpine* in connection with eserine, the comparison of experiments (5) and (8), (28) and (24), (28) and (25), (29) and (26), (27) and (24), (4) and (7), (6) and (9), (21) and (15), (59) and (52), (60) and (51), (60) and (57), making a total of eleven comparisons, shows six in favor of pilocarpine and five in favor of eserine alone.

A few of the experiments seem to show distinctly in favor of pilocarpine; with the others the comparison is but slightly in its favor. On the whole, the comparison is not strongly in favor of pilocarpine.

Eserine alone, as compared with eserine and atropine. A comparison of experiments (21) and (59), (29) and (60), (4) and (59), (5) and (59), (6) and (60), (13) and (59), (14) and (60)—a total of seven comparisons—shows six strongly in favor of atropine and one with results about equal.

NOTE.—All the comparisons in this paragraph, of eserine with eserine and atropine, are with different horses, and should not, therefore, be estimated at the same value as though the compared doses had been given to the same horse for each comparison. It seems quite clear, however, that atropine in very small doses makes a desirable addition to eserine.

Eserine as compared with eserine, pilocarpine, and atropine. The comparison of experiments (29) and (51) (different horses); (17) and (57) (different horses); (5) and (43) (different horses); (4) and (53) (different horses); (28) and (54) (different horses); (21) and (52) (different horses); (27) and (31) (same horse); (27) and (33) (same horse); (29) and (36) (same horse); (27) and (34) (same horse); (48) and (34) (different horses); (18) and (31) (same horse), making a total of twelve comparisons, with seven distinctly in favor of pilocarpine and atropine, three in favor of eserine alone, and two with results practically equal. On the whole, the comparison is decidedly in favor of the combination.

Eserine and pilocarpine as compared with eserine, pilocarpine, and atropine. A comparison of experiments (9) and (10) shows distinctly

in favor of atropine; (37) and (43) also distinctly in favor of atropine.

Eserine and pilocarpine as compared with eserine, pilocarpine, and strychnine. A comparison of experiments (7) and (11), (37) and (45), (37) and (47), (15) and (11), (26) and (11), making a total of five comparisons, with two strongly in favor of strychnine; two distinctly in favor of strychnine; and one with results about equal.

Eserine, pilocarpine, and atropine as compared with eserine, pilocarpine, and strychnine. A comparison of experiments (43) and (47), (43) and (45), (36) and (62), (36) and (44), (52) and (47) (different horses); (54) and (46) (different horses); (51) and (44) (different horses); (57) and (46) (different horses)—a total of eight comparisons, seven strongly in favor of strychnine and one with results about equal. The whole comparison is strongly in favor of the strychnine in the matter of weights of actual feces moved, number of discharges, and permanence of effect. (See Tables D, E, and F.)

With hypodermic cathartics the item of balancing the medicine used is very important, especially with atropine and strychnine, too much of either being objectionable and too little without effect.

I have endeavored to make a comparison of eserine combinations with barium chloride, using moderate and representative doses of each. These comparisons are selected at random, some of them being upon the same horse and quite a number with different horses. I wish to emphasize the fact that I do not attach much importance to comparison of different cathartics on different horses in isolated cases, but if a number of experiments can be gotten together the general averages mean something. Another lot of comparisons, selected at random might vary the results to some extent, but not a great deal.

A comparison of E. 59 (dose, eserine 2 gr., atropine 0.05 gr.) with B. 3 (dose, 8 grammes per mouth) shows distinctly in favor of the barium.

A comparison of E. 60 (dose, eserine 2 gr., atropine 0.05 gr.) with B. 2 (dose, 8 grammes per mouth) shows results practically equal, the weight somewhat in favor of barium.

A comparison of E. 58 (dose, 1.5 eserine gr., pilocarpine 4 gr., atropine 0.05 gr.) with B. 8 (dose, 12 grammes per mouth) shows in favor of the eserine, but both very unsatisfactory.

Comparison of E. 52 (dose, eserine 2 gr., pilocarpine 4 gr., atropine 0.05 gr.) with B. 21 (dose, 1 gramme intravenously) shows

slightly in favor of the barium; pain in favor of the barium; weight of feces in favor of the eserine.

Comparison of E. 51 (dose, eserine 2 gr., pilocarpine 4 gr., atropine 0.05 gr.) with B. 22 (dose, 1 gramme intravenously) shows very strongly in favor of the barium.

Comparison of E. 54 (dose, eserine 1.5 gr., pilocarpine 4 gr., atropine 0.05 gr.) with B. 1 (dose, 8 grammes per mouth) shows results practically equal.

Comparison of E. 53 (dose, eserine 2 gr., pilocarpine 4 gr., atropine 0.05 gr.) with B. 4 (dose, 10 grammes per mouth) shows strongly in favor of eserine.

Comparison of E. 43 (dose, eserine 2 gr., pilocarpine 4 gr., atropine 0.05 gr.) with B. 15 (dose, 10 grammes per mouth) shows slightly in favor of the eserine (different horses).

Comparison E. 36 (dose, eserine 2 gr., pilocarpine 4 gr., atropine 0.05 gr.) with B. 32 (dose, 1 gramme intravenously) shows very strongly in favor of eserine (different horses).

Comparison of E. 47 (dose, eserine 2 gr., pilocarpine 4 gr., strychnine 0.25 gr.) with B. 28 (dose, 1 gramme intravenously) shows strongly in favor of eserine (different horses).

Comparison of E. 44 (dose, eserine 2 gr., pilocarpine 4 gr., strychnine 0.25 gr.) as compared with B. 8 (dose, 12 grammes per mouth) shows strongly in favor of eserine (different horses).

Comparison of E. 45 (dose, eserine 2 gr., pilocarpine 4 gr., strychnine 0.5 gr.) with B. 7 (dose, 12 grammes per mouth) shows distinctly in favor of barium (different horses).

Comparison E. 41 (dose, eserine 2 gr., pilocarpine 4 gr., strychnine 0.5 gr.) with B. 30 (dose, 1.5 grammes intravenously) shows strongly in favor of the barium (different horses).

Comparison E. 42 (dose, eserine 2 gr., pilocarpine 4 gr., strychnine 0.5 gr.) with B. 31 (dose, 1 gramme intravenously) shows strongly in favor of the barium (different horses).

Comparison E. 53 (dose, eserine 2 gr., pilocarpine 4 gr., atropine 0.05 gr.) with B. 6 (dose, 12 grammes per mouth) shows slightly in favor of the barium, both nearly ideal; both pain and weight slightly in favor of the barium (same horse).

Comparison of E. 57 (dose, eserine 1.5 gr., pilocarpine 4 gr., atropine 0.05 gr.) with B. 17 (dose, 0.75 grammes intravenously) shows strongly in favor of the barium, especially as to pain (same horse).

Comparison E. 58 (dose, eserine 1.5 gr., pilocarpine 4 gr., atropine 0.05 gr.) with B. 18 (dose, 0.75 grammes intravenously) shows

results practically equal ; pain in favor of the barium ; weight of feces in favor of the eserine.

A total of seventeen comparisons: seven in favor of the eserine combinations, seven in favor of barium, and three with results practically equal—a remarkably even comparison for experiments selected at random.

I have endeavored to select only such experiments as illustrate moderate doses wherein the effects were reasonably representative. It is evident that with the intravenous use of the barium the results are more uniform, and there is a greater uniformity among different horses as to susceptibility than when this drug is administered per mouth.

When we compare the newer cathartics—eserine and barium—with aloes as to the actual amount of feces moved, uniformity of satisfactory results when used solely for cathartic effect, uniformity of susceptibility, and in any case when the element of time is not all important, the result is very much in favor of the latter. Especially is it true in the matter of actually unloading the rectum and colon. The cathartic effect seems to last longer, the pain disturbance is uniformly less, with no muscular tremors under ordinary circumstances. There is no objection to aloes as to possible heart-complications ; there is but a slight tenesmus under ordinary circumstances and much less after-constipation than with either eserine or barium. In any case, when I have time to wait, my preference among these is decidedly in favor of aloes for horses.

General comparison of eserine, pilocarpine, etc., compared with barium. In the item of expensiveness the comparison is decidedly in favor of barium. Permanence of chemical form greatly in favor of barium. Ease of administration in favor of the eserine. Promptness of effect is, first, in favor of the barium per intravenous method; next, in favor of the eserine hypodermically ; third, in favor of the barium per mouth. As to cathartic results, considering numbers and weights of discharges, the decision is uncertain, results being practically equal. The comparison as to pain-disturbance is in favor of the barium. Muscular tremors stand distinctly in favor of the barium. I think the comparison as to certainty of cathartic effects is in favor of the eserine, for I have found several horses that did not respond to large doses of barium. It is true that horses vary somewhat in susceptibility to eserine, but not to the extent as with barium. I have never found any horse in normal condition that did not respond to reasonable doses of good eserine.

When we compare the two in reference to the possibility of serious or even fatal results, the comparison is very much in favor of the eserine.

As to the disturbance in temperature, pulse, and respiration, neither has shown any uniform results. As to the after-effect upon the bowels I am not prepared to express an opinion. My experience with the two drugs gives me the impression that with repeated doses of eserine the susceptibility increases and with barium it decreases; but this is not given as an assertion of fact.

As to dosage: The smallest dose of eserine which has given good results was 1 gr. (see E. 18). The largest dose of atropine which has allowed satisfactory results has been 0.1 gr. (see E. 16). I consider the largest dose of eserine advisable under ordinary circumstances to be 3 gr., and would usually give less.

In using strychnine with the eserine we should not use more than 0.5 gr., and usually but 0.25 gr. I believe this commonly increases the amount of actual feces moved and adds to the desirable effect of the eserine. Ordinarily I would not use more than 0.05 gr. atropine.

As to pilocarpine, I am skeptical as to its value in connection with eserine.

As to barium, I would not give less than 8 grammes nor more than 15 grammes per mouth, and not more than 1.5 grammes intravenously, nor less than 0.75 grammes per 1000 pounds, if I was anxious to have definite results. Since the experience with B. Exp. 11, and also with the horses "Brownie" and "Prince," the writer is somewhat afraid of barium in bolus or capsule. When using barium in solution, an ordinary dose should be dissolved in from six to eight ounces of water.

The intravenous injection of barium chloride is feasible in general practice without the employment of fine technique.

Three to 5 c.c. of air have been injected several times without noticeable effect. I have only known one case of serious local trouble among all that have been reported with the exception of my own (B. 32).

The physiological effects which writers on human *materia medica* describe—depression of the temperature and slowing of the heart, etc.—have not been manifested in these experiments; neither any posterior paralysis, except in the fatal case (B. 11), and no case of peculiar posterior lameness such as others have reported.

My experience with hypodermic cathartics, of which eserine forms

the basis, and with barium, gives me the opinion that both are useful, but should not replace the old cathartics.

Barium is useful, but not the ideal, harmless drug of magic power and accuracy for simple catharsis or the treatment of colics which some of our friends would lead us to think.

DISCUSSION.

Dr. Bell : It is a subject that is attracting a great deal of attention, and the opinions with regard to the effects of the various combinations are as numerous almost as the experiments. I think that almost all veterinarians experiment with the various combinations and make up their minds which they are most fond of, according to their experience, and finally settle to one form of treatment. As regards my own experience, I have had but little with these combinations, preferring, in all cases where possible, to rely upon the old, and which I consider the most reliable form of treatment.

Dr. Gill : I have had the same experience as Dr. Reynolds in the use of barium chloride and eserine. We cannot always depend upon getting the same results. I have found in giving a regular dose of eserine to a horse to get those symptoms spoken of by Dr. Reynolds, and also in barium-chloride treatment, I prefer to use, and do use to a great extent, the alkaloid aloin. It is more easily prepared and more stable and reliable. The bad effects of the drug, such as pain, etc., are not as great with aloin, and I rely almost entirely on it in my practice where I need a slow cathartic—that is, in relation to the other alkaloids on it.

Dr. Rechtenwald : In my use of these drugs the horses die so quick under the influence that I cannot get time to see its effects.

Dr. Reynolds : I hope I have not conveyed a wrong impression to this body: that I have condemned either barium or eserine. I want to say that I consider them both useful, but I specially want to take away the unreasonable amount of credit and confidence that we have given to barium.



PHYSIOLOGICAL VARIATIONS.

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IN biological study we generally identify form with function, but sometimes their relations are vague, at others they wholly elude our perception, yet we usually assume the interdependence of anatomy and physiology.

We are not clear as to which is cause and which is effect, although as a rule we attribute physiological or pathological phenomena to structural differences, but it seems more probable that the reverse is true, and that anatomical peculiarities are due to physiological variations. We attribute the form of the ruminant to rumination, not rumination to the complexity of the stomach; carnivorous teeth to the devouring of flesh, and not flesh-eating to the form of teeth, yet, knowing the functions of these organs, we may refer an animal to a given order by their form. In animal physiology, whether normal or pathological, it is important that in so far as possible we comprehend each function in its true light and not erroneously ascribe physiological peculiarities to irrelevant details in structure.

It is a current practice in medicine, not wholly unknown in other professions, to attempt to answer all questions propounded with some plausible theory, which, if it does not explain, serves at least to cover up some very rugged points, and so we attempt frequently to explain the occurrence of physiological or pathological phenomena by some imaginary or irrelevant anatomical detail. A good example of this recklessness in formulating theories is the common explanation given of the occurrence of roaring in horses by attributing it, and its usual seat on the left side, to the disposition of the left recurrent laryngeal nerve; but when we recall that other domestic animals, in none of which roaring occurs, have the same disposition of the nerve, it is evident that we must look further for an explanation, and conclude that the existence of roaring in horses is dependent rather upon some physiological variation than anatomical peculiarity. Closely allied in many respects is the peculiar equine malady, which,

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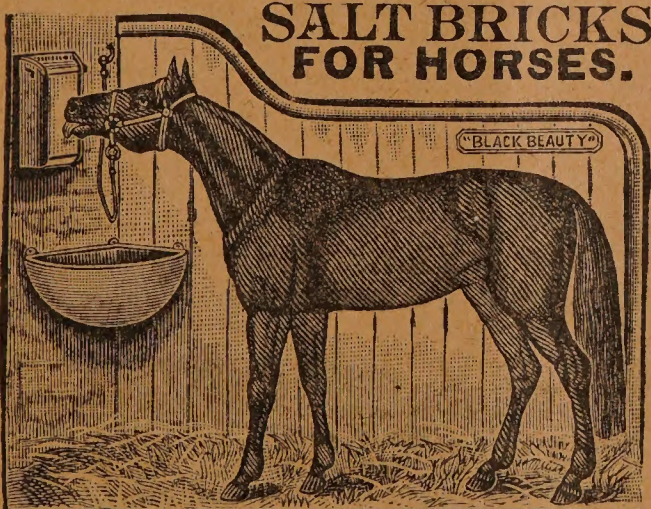


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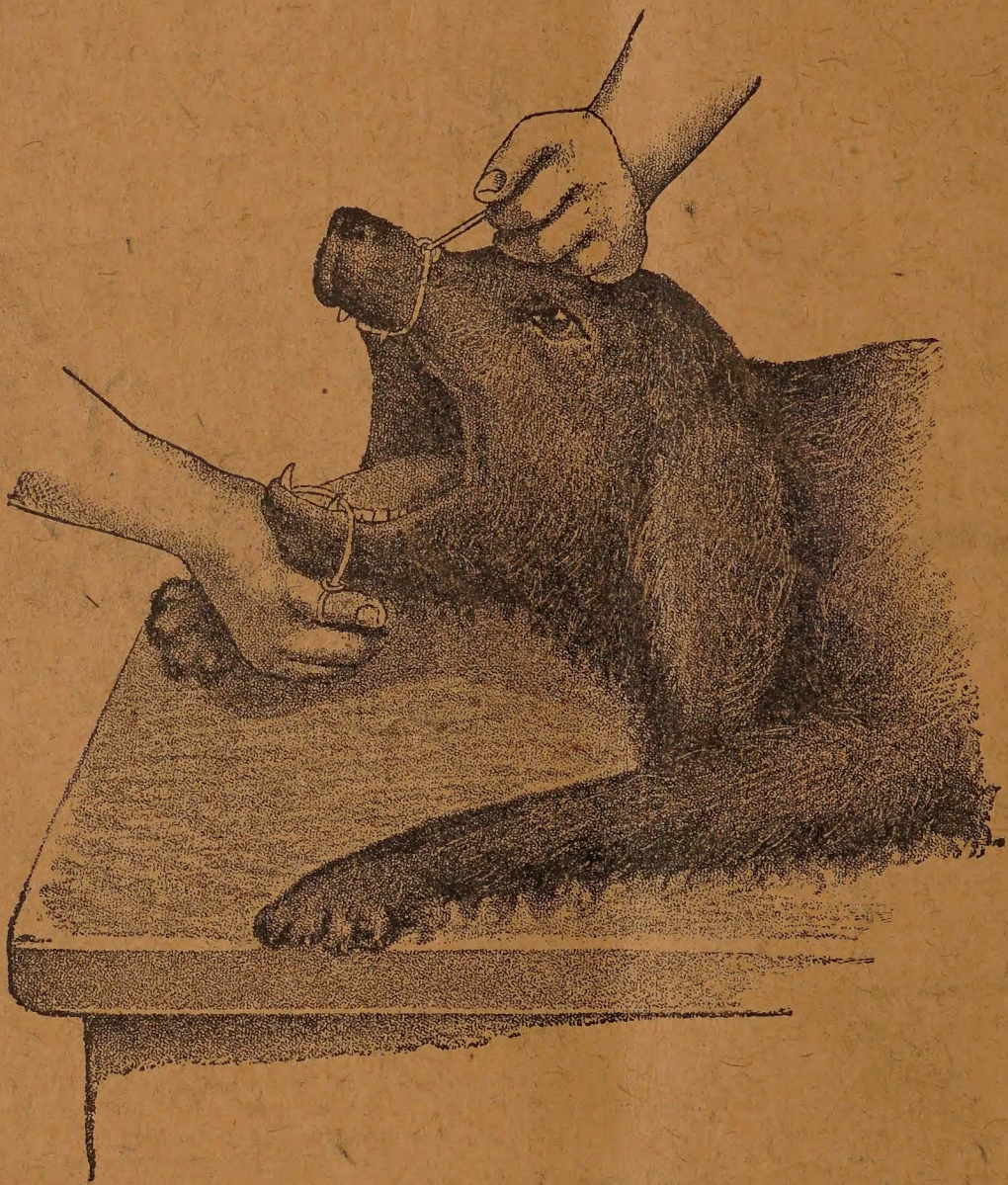
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